Globalization, income distribution and voter preferences:

Transmission mechanisms and reform acceptance

Inauguraldissertation zur Erlangung des Doktorgrades im
Fachbereich Wirtschaftswissenschaften der Universität Mannheim

Tanja Hennighausen

Abteilungssprecher:	Prof. Dr. Eckhard Janeba
Referent:	Prof. Dr. Roland Vaubel
Korreferent:	PD. Dr. Friedrich Heinemann
Tag der mündlichen Prüfung:	04. März 2014

Preface

First of all, I would like to thank Prof. Dr. Roland Vaubel for the opportunity to start my dissertation at his chair. I appreciate that he gave me the necessary freedom to work on my different research projects. I also wish to thank PD Dr. Friedrich Heinemann for his immediate willingness to co-supervise my thesis.

This thesis has been completed during my work at the Centre for European Economic Research (ZEW) and the Department of Economics at the University of Mannheim. I had several colleagues who contributed much to the success of my research. In particular, I would like to thank my co-authors Friedrich Heinemann, Ivo Bischoff and Marc-Daniel Moessinger for the fruitful cooperation. I also thank Katharina Finke for her continuous support during the whole dissertation process and her helpful advice.

I am also indebted to many former and current colleagues at the ZEW and at the University for the pleasant work environment, inspiring discussions, numerous lunch and coffee breaks, evening activities and trips to the surroundings of Mannheim. I very much enjoyed spending the time with you.

Special thanks go to my family and friends for providing distraction and for keeping me in good humor. Moreover, I thank my sister-in-law Barbara for proof-reading large parts of this thesis. Last but not least, I am deeply grateful to my parents and my brother Axel for their unconditional support and their confidence in me.

Table of Contents

List of Figures

List of Tables

Chapter 1

General introduction

This thesis consists of two self-contained parts, which examine the distributional consequences of globalization (chapters 2 to 9) and the ability to conduct market-friendly reforms from the perspective of industrialized countries (chapters 10 to 14). In the first part of this thesis, I analyze how international trade and capital mobility affect the income distribution in industrialized countries. The second part deals with general attitudes of voters toward a range of policies in the fields of the labor market, social security and tax system.

The opinion on the benefits of international trade and factor mobility is presumably the issue in which the perception of economic experts deviates most sharply from the public's views. One reason for these different assessments may be that both groups' judgements refer to different aspects of global integration: whereas economists usually assess the consequences of globalization based on the expected positive effects on efficiency and therefore on overall welfare, the public debate focuses mostly on the distributional consequences. But usually economic experts are also aware of a potential distributional impact of globalization. In particular, the concern that certain domestic groups have to bear losses due to a stronger economic integration while others benefit is firmly rooted in economic theory (such as neoclassical trade models).

This issue has been addressed also by numerous empirical works that provide, however, rather mixed results. A possible explanation for the inconclusive evidence by earlier studies might be related to their conceptualization. In particular, the focus on only one specific aspect of income distribution (such as the dispersion of wages) may not provide an adequate description of the distributional consequences of growing international integration. Similarly, an isolated analysis of the personal distribution of market or even disposable incomes without a further inspection of

the different channels through which globalization influences income inequality is not satisfactory. Even if the results point at an impact of globalization on income inequality, the formulation of concrete policy recommendations would require a more profound knowledge of the exact mechanisms.

Hence, the main focus of my study is on the role of different transmission mechanisms through which globalization affects the distribution of incomes. Based on theoretical reasoning, the following transmission mechanisms are considered in the empirical analysis: the labor income share and the earnings dispersion in order to account for potential adjustments in the relative factor rewards, the unemployment rate, the relative supply of human capital and the net income of unemployed persons relative to workers.

Based on a panel of OECD countries covering the period between 1960 and 2010, I analyze empirically how different aspects of globalization affect these transmission mechanisms. In a second step, I test how these transmission mechanisms are related to the distribution of market and disposable incomes as well as the degree of income redistribution. The results indicate that this comprehensive view on the distributional consequences of globalization is justified since several transmission mechanisms have been proven relevant. This also applies to factors, which have so far been neglected such as adjustments in the relative supply of educated workers. A further relevant empirical finding of my analysis is the relevance of domestic institutions for the evolution of labor market outcomes and income inequality. In particular, the institutional design of the labor markets plays a crucial role in determining how a country is affected by a rising exposure to international trade of goods and factors.

Motivated by this finding, the second part of this thesis is devoted to the study of a country's ability to create a potentially market-friendly institutional environment in order to cope with the challenges of globalization. From the perspective of a globalized country, reforms in the fields of labor market institutions, social security and the tax system might be desirable. In a democracy, however, the ability to conduct those reforms depends crucially on the support by voters. I therefore study the individual determinants of German voters' attitudes toward selected reforms. This analysis of policy preferences by German voters covers a wide range of policy proposals, which have been part of recent reform debates (e.g. in the context of the so-called "Agenda 2010"). The empirical tests of the chapters 11 to 13 are based on survey data from the German General Social Survey (ALLBUS) that is designed to be representative for the German population. This data set offers valuable infor-

mation both on the respondents' assessment of different policies and on a range of attitudes as well as their individual characteristics.

In chapter 11 I start with an empirical analysis of the individual determinants of tax rate preferences, which is based on joint work with Friedrich Heinemann.[1] In this study we use survey information on German voters' attitudes toward progressive, proportional, and regressive taxation. Based on theoretical considerations, we explore the factors which, beyond individual financial gains, should drive preferences for progressive taxation. Our empirical results confirm that the heterogeneity in individual attitudes is not solely driven by a person's pecuniary interest. Rather, the choice of the favored tax rate also depends on fairness considerations and beliefs about the role of effort for economic success.

In chapter 12 (co-authored with Friedrich Heinemann and Ivo Bischoff)[2] a similar approach has been applied for studying the drivers of labor market reform acceptance. We use information about German voters' opinion toward benefit cuts, cutting subsidies to declining industries, phasing out of employment programs or a liberalization of employment protection. Again, we expect that beyond the pecuniary interest, a person's level of information, fairness judgements, economic beliefs as well as other individual factors such as socialization under the communist regime in the former German Democratic Republic matter for reform preferences. The empirical results support this notion: although self-interest is important for the assessment of labor market policies, a number of factors well beyond the narrow scope of self-interest also shape individual reform preferences.

The readiness to support an increase of the statutory pension age is analyzed in depth in chapter 13, which draws on a joint work with Friedrich Heinemann and Marc-Daniel Moessinger.[3] In the light of the demographic change, the German pay-as-you-go pension system is highly unsustainable. Nevertheless, reforms, such as a higher pension age, are highly unpopular. This contribution focuses on the role of intrinsic motivation as a driver for pension reform preferences. Theoretical reasoning suggests that this driver should be relevant as it decreases the subjective costs of a higher pension age. The empirical results support this key hypothesis unambiguously: in addition to factors such as age or education, the inclusion of

---

1 This chapter is based on the paper "Don't Tax Me? Determinants of Individual Attitudes Toward Progressive Taxation" published in German Economic Review (forthcoming).

2 The content of this chapter is based on the paper "Choosing from the Reform Menu Card - Individual Determinants of Labour Market Policy Preferences" published in the Jahrbücher für Nationalökonomie and Statistik 229, 180-197.

3 This chapter is based on the essay "Intrinsic Work Motivation and Pension Reform Preferences" published in Journal of Pension Economics and Finance 12, 190-217.

intrinsic work motivation helps to improve our prediction of an individual's reform orientation.

The analyses of the individual determinants of policy preferences point at the relevance of economic beliefs as an explanation for the individual heterogeneity in reform acceptance. Individuals who perceive that everyone is responsible for his own economic situation and that effort pays off are also more likely to support market-friendly reforms and lower degree of income redistribution. Despite the relevance of individual beliefs, our understanding of the factors that explain these perceptions is still incomplete. Against this background, I focus on the role of television and analyze whether it has the power to persistently affect individual beliefs about the drivers of success in life (see chapter 14[4]). For that purpose, I exploit a natural experiment on the reception of West German television in the former German Democratic Republic. After identifying the impact of Western television on individual beliefs and attitudes in the late 1980s, longitudinal data from the German Socio-Economic Panel is used to test the persistence of the television effect on individual beliefs during the 1990s. The empirical findings indicate that Western television exposure has made East Germans more inclined to believe that effort rather than luck determines success in life. Furthermore, this effect still persists several years after German reunification.

[4] The content of this chapter is based on "Exposure to Television and Individual Beliefs: Evidence from a Natural Experiment" (ZEW Discussion Paper No. 12-078).

Part I

Globalization and income inequality: Identification of transmission mechanisms

Chapter 2

Introduction

In the past decades, the distribution of incomes has become more unequal in several developed countries. At the same time, the economic integration of these countries into the world markets has increased substantially. This coincidence between the growing exposure to international trade or capital mobility and the income dispersion has raised the question of a possible causal link between these developments. Economic theories such as neoclassical trade models have long established a framework to assess the distributional consequences of globalization. These models primarily suggest that certain domestic groups (e.g. unskilled workers in the industrialized countries) have to bear losses, whereas others benefit from a stronger economic integration. Despite the straightforward theoretical predictions, the empirical evidence provides rather mixed results concerning the impact of globalization on the income distribution in developed countries.

This may be explained by the fact that most empirical works study only one specific aspect of the possible impacts of globalization on the income distribution. In particular, the link between international trade and wage inequality has been analyzed extensively. These analyses do, however, not account for the possibility that international trade and factor mobility affect the distribution of incomes through different channels. A study focusing only on the consequences of globalization on the distribution of wages, for example, neglects the potential impact on employment, the rewards of capital or adjustments in the supply of educated workers. Moreover, these channels might either mitigate or reinforce the impact of globalization-induced changes in the wage dispersion on overall income inequality. Hence, it is not possible to infer only from a significantly positive effect of international trade or capital mobility on wage dispersion that globalization raises income inequality. Furthermore, the joint existence of different transmission mechanisms through which globaliza-

tion affects income inequality could also explain the often insignificant results in regressions of income inequality on indicators for global integration.

This study therefore aims at providing a more comprehensive analysis to enhance our understanding of the distributional consequences of globalization. I identify several channels through which globalization might influence the personal distribution of market and disposable incomes and test their relevance based on an unbalanced panel of 28 industrialized countries from 1960 to 2010. In particular, I elaborate on the impact of the following transmission mechanisms: the labor income share, the degree of wage dispersion, the unemployment rate, the relative supply of human capital and the net income of unemployed persons relative to workers. In a further step, I consider the possibility that both the impact of globalization on these transmission mechanisms and the extent to which their changes affect the income distribution depends on the design of domestic institutions. Finally, I discuss how deviations from my standard estimation approach with respect to different specifications and estimators, variations in the sample of countries and additional controls accounting for alternative explanations would affect the results.

The remainder of this study is organized as follows: chapter 3 illustrates some stylized facts on the evolution of globalization and the distribution of incomes in OECD countries since the 1970s. In chapter 4, I briefly review the empirical literature on the relationship between increasing global integration and the distribution of wages or incomes. Chapter 5 discusses the theoretical literature on the distributional consequences of globalization. Based on the theoretical predictions, I also introduce the transmission mechanisms through which globalization should affect the distribution of incomes. The empirical approach and the data are described in chapter 6. Chapter 7 presents the results of the empirical analysis and includes extensive robustness checks. To provide an insight into the quantitative impact of the transmission mechanisms, chapter 8 extents the analysis in this respect. For that purpose, I estimate the standardized beta coefficients for the globalization variables and the transmission mechanisms on the basis of a common sample. Finally, chapter 9 summarizes the results and concludes.

Chapter 3

Globalization and the income distribution in industrialized countries

3.1 International trade and capital mobility

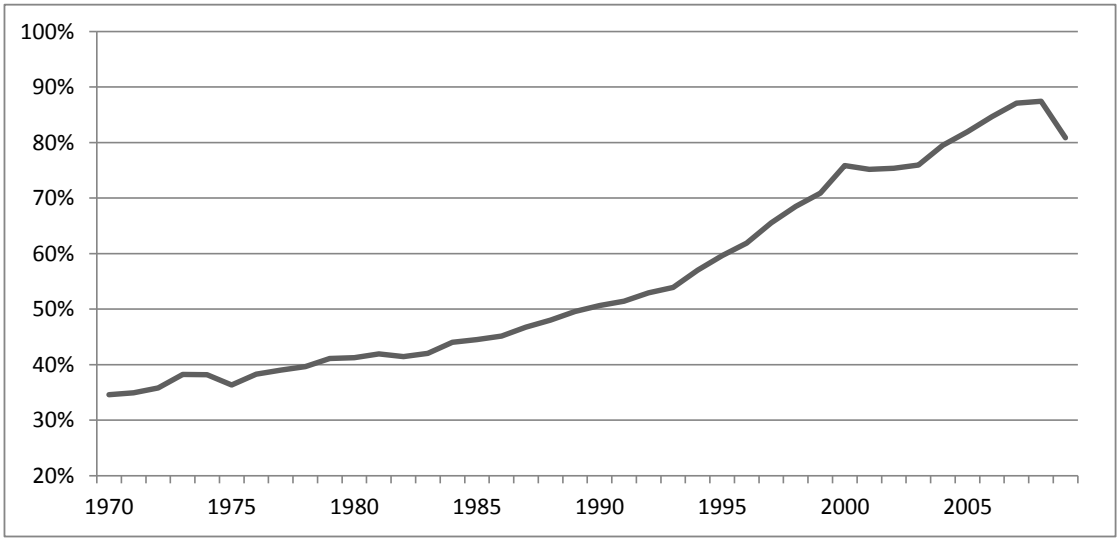
The economic integration of OECD countries has increased substantially since the middle of the 20^{th} century. Although globalization is not a recent phenomenon, the elimination of political barriers to trade and capital mobility as well as improvements in transportation and communication technologies in the last decades have lowered the trade costs considerably.

This is also reflected in the rising importance of international trade for OECD countries. Figure 3.1 illustrates the evolution of trade openness, i.e. the sum of exports and imports of goods and services as a percentage of GDP, for an average of 26 OECD countries[5] between 1970 and 2009. The share of trade in goods and services in domestic output increased substantially from 35 percent in 1970 to 81 percent in 2009. Moreover, the rising exposure to international trade is common to all countries. In 18 of the 26 countries the trade-to-GDP ratio has more than doubled during that period.[6]

[5] Included are the following countries (based on data availability): Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Israel, Italy, Japan, Korea, Mexico, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, United Kingdom and United States.

[6] Despite the growing relevance of international trade for all countries, there is also a considerable variation as the overall increase in openness from 1970 to 2009 ranges from 15 percent in Iceland to about 480 percent in Korea.

Figure 3.1: Trade openness (1970-2009)



Ratio of exports and imports of goods and services in percent of GDP (average of 26 OECD countries).
Data source: OECD (2010c)

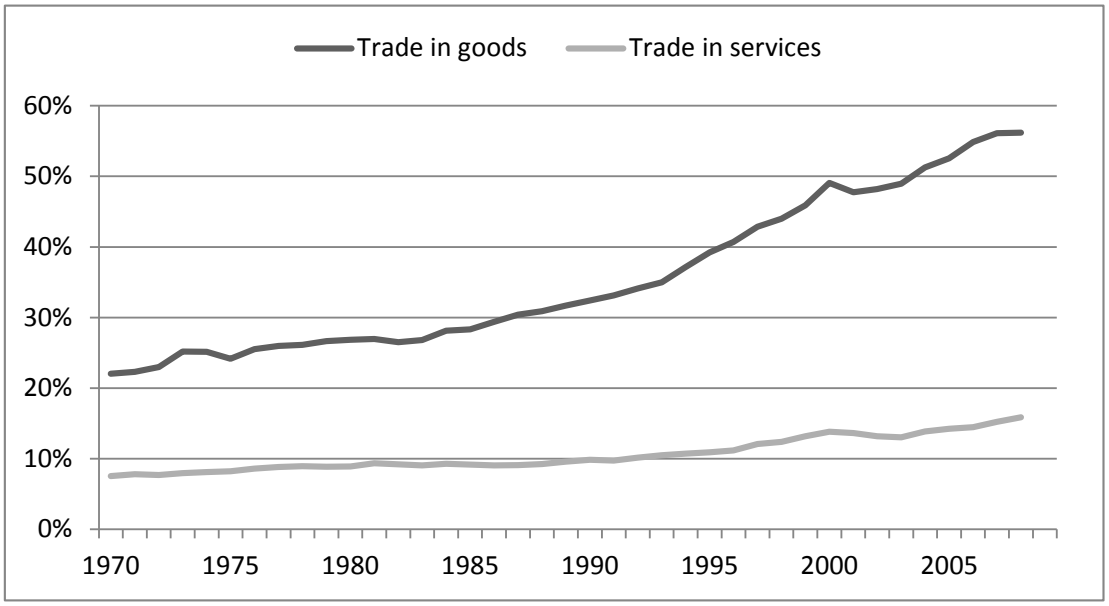
Figure 3.2 presents the changes in openness separately for trade in goods and in services for twelve OECD countries.[7] Trade in goods is more relevant than trade in services and also the rise in overall openness is mainly driven by changes in goods trade. Nevertheless, international trade in services as a share of GDP has also doubled between 1970 and 2008, whereby most of the increase had occurred since the 1990s.

Not only the volume of trade but also trade patterns have changed during the recent decades. Figure 3.3 depicts the trend in the relative importance of imports from non-OECD countries for an average of 23 OECD countries.[8] The share of imports from less developed countries was relatively stable until the mid-1990s but has almost doubled since then. Since imports from low-wage countries are assumed to threaten unskilled workers in advanced economies (see chapter 5), they are of particular interest for studying the distributive effects of globalization. Nevertheless, in 2012 imports from developing countries contribute on average only to 26 percent of total imports. This suggests that trade between OECD countries is quantitatively more important.

[7] Australia, Canada, Finland, France, Germany, Greece, Israel, Italy, Korea, Norway, United Kingdom and United States.

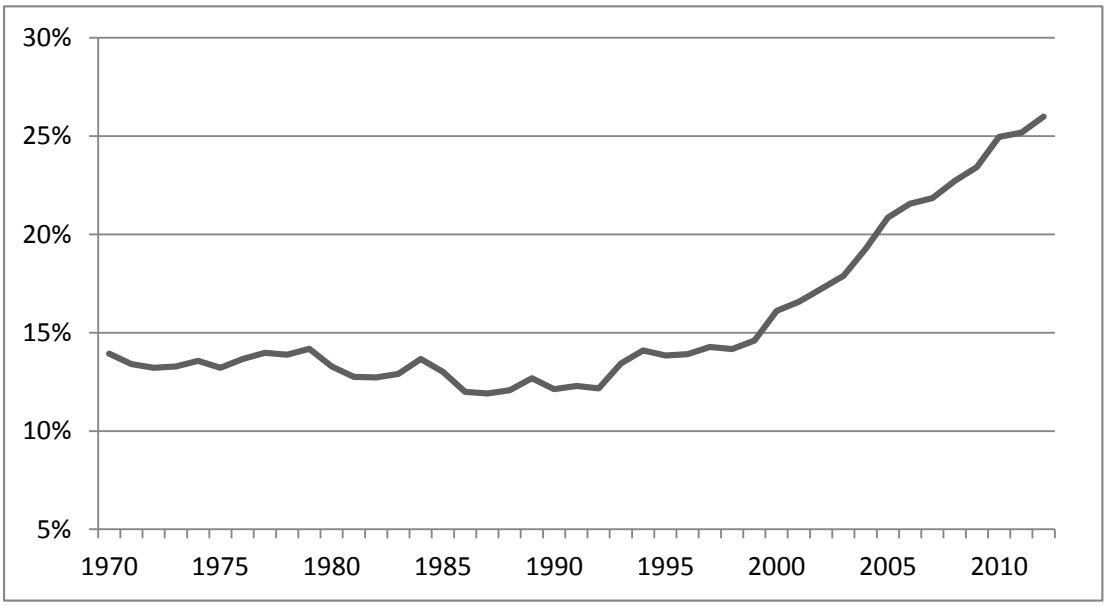
[8] Included are the following countries: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, United Kingdom and United States.

Figure 3.2: Trade openness for goods and services (1970-2008)



Exports plus imports in goods in percent of GDP and exports plus imports in services in percent of GDP for an average of 12 OECD countries.
Data source: OECD (2010c)

Figure 3.3: Imports from non-OECD countries (as a share of total imports, 1970-2012)

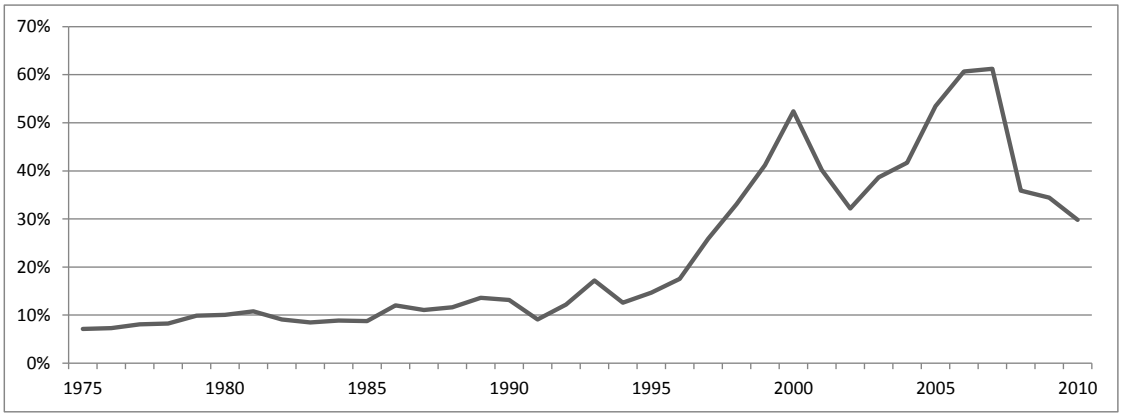


Share of good imports from non-OECD (excl. OPEC) countries as a percentage of total good imports. The calculation is based on the average of 23 OECD countries.
Data source: OECD (2013b)

Besides the rise in trade openness, the recent globalization period is, in particular, characterized by the integration of international capital markets. Unlike the trade of goods, international capital movements were highly regulated during the 1950s and 1960s. Their liberalization started in the 1970s after the end of the Bretton Woods era. Since then, the international mobility of capital has increased considerably.

Figure 3.4 shows how the volume of cross-border flows of private capital (i.e. the sum of imports and exports of foreign direct, portfolio and other investment capital) as a share of GDP has evolved between 1975 and 2010 on the average for 19 OECD countries.[9] Cross-border flows of private capital have increased substantially since the mid-1970s, whereby the strongest growth has occurred since the mid-1990s. During the recent global recessions (2001 - 2003 and 2008 - end of the period under consideration), the volume of international investments has declined considerably. At its peak in 2006 the average volume of international private capital flows exceeded 60 percent of the GDP. There exists, however, a substantial variation between the 19 examined countries: in 2006 gross international investments made up less than one percent of the GDP in Japan but was about 3.98 times the GDP in Ireland.

Figure 3.4: Cross-border flows of private capital (as a share of GDP, 1975-2010)

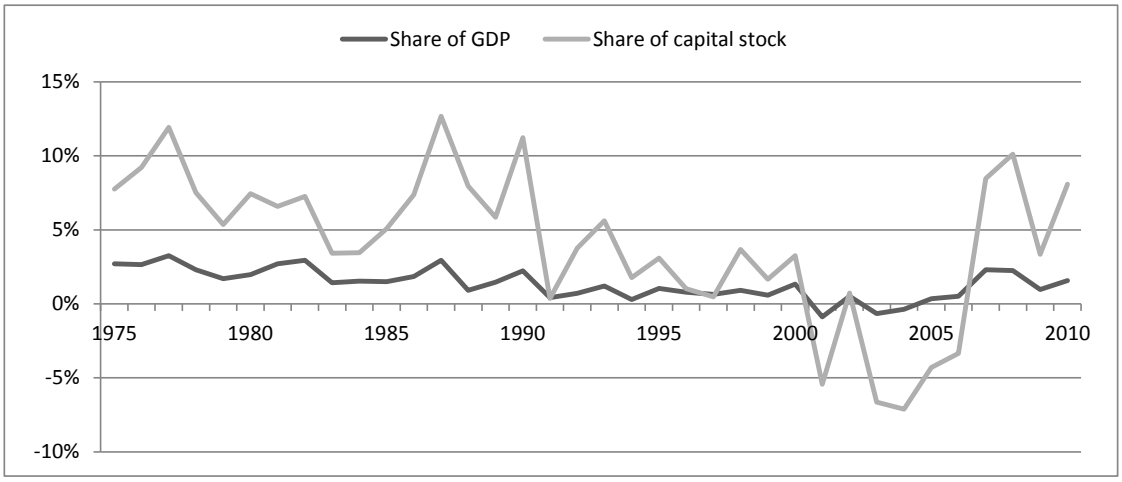


Sum of foreign direct, portfolio and other investments abroad and in the respective economy as a share of GDP. The calculation is based on the average of 19 OECD countries.
Data source: IMF (2012) and World Bank (2012)

The acceleration in the growth of international investments since the mid-1990s is likely affected by waves of deregulation and privatization in several transformation and developing countries, which attracted capital from advanced economies. Despite

[9] The following countries are included: Australia, Austria, Canada, Denmark, Finland, France, Germany, Ireland, Israel, Italy, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Turkey, United Kingdom and United States.

Figure 3.5: Net private capital imports (1975-2010)



Imports minus exports of foreign direct, portfolio and other investments as a share of GDP (dark grey line) and a share of gross fixed capital formation (light grey line). Calculated based on the average of 19 OECD countries.
Data sources: IMF (2012), World Bank (2012) and OECD (2012b).

the attractiveness of newly industrialized economies to foreign investors, industrialized countries remain, at least partly, net importers of foreign capital. On average, however, the position of the 19 OECD countries, which are considered in Figure 3.5, as net importer of private capital has weakend since the mid-1990s (although this trend is reversed recently). From 2001 to 2004 these countries experienced on average a net capital outflow. In 2004 net capital exports were equal to 7 percent of the capital stock or 0.4 percent of the GDP. The mere focus on averages conceals a substantial cross-country variation: while Denmark, Norway and Sweden experienced sizable net exports of capital, which exceed 55 percent of their gross fixed capital formation in 2004, Australia, New Zealand, Portugal, the United Kingdom and the United States imported foreign capital equal to more than 20 percent of their capital formation.

3.2 Income distribution

A major concern of globalization skeptics are the potentially adverse distributive effects of increasing international integration. In particular, a greater openness to trade and factor mobility is assumed to hurt low skilled workers in the industrialized countries and raise income inequality there.[10]

[10] This work focuses on the influence of globalization on income inequality within industrialized countries and does not analyze developing countries. In principle, neoclassical theories suggest

Figure 3.6 presents information on the distribution of disposable incomes for 15 OECD countries for the mid-1980s to the mid-2000s.[11] The Gini coefficients[12] measure the dispersion of equivalent disposable incomes for individuals who live in households headed by a person aged 25 to 64. Inequality has risen in twelve countries but decreased in Denmark, France and Ireland. Thus, the trend toward greater economic integration has indeed coincided with growing inequality in the distribution of disposable incomes in most OECD countries. Nonetheless, the comparison of the Gini coefficients of disposable incomes does not provide full support of the view that globalization raises income inequality in industrialized countries. In particular, since the more egalitarian Northern European countries are also more open, comparing the dispersion of disposable incomes alone is not sufficient to provide a complete picture of differences in the distribution and their evolution. International differences in the inequality of market incomes may not translate into respective differences in disposable incomes if the extent and effectiveness of redistribution also varies between countries. Figure 3.7 presents the Gini coefficients of the market income distribution and the share of market inequality that has been reduced through public redistribution in the mid-2000s.

Market incomes (i.e. wages, self-employment and capital incomes) are more unequally distributed than disposable incomes indicating that the tax and transfer system reduces inequality. The average Gini coefficient of the distribution of market incomes is approximately 40. Market income inequality varies also substantially between the examined countries: it is lowest in Switzerland (Gini coefficient of 30) and highest in Israel with a Gini coefficient of 48. Beyond that, the degree to which market incomes inequality translates into a higher inequality of disposable incomes differs. On average, income redistribution through direct taxes, social security contributions and transfers lowers the market-induced inequality by nearly 12 Gini points (or by 29.5 percent).

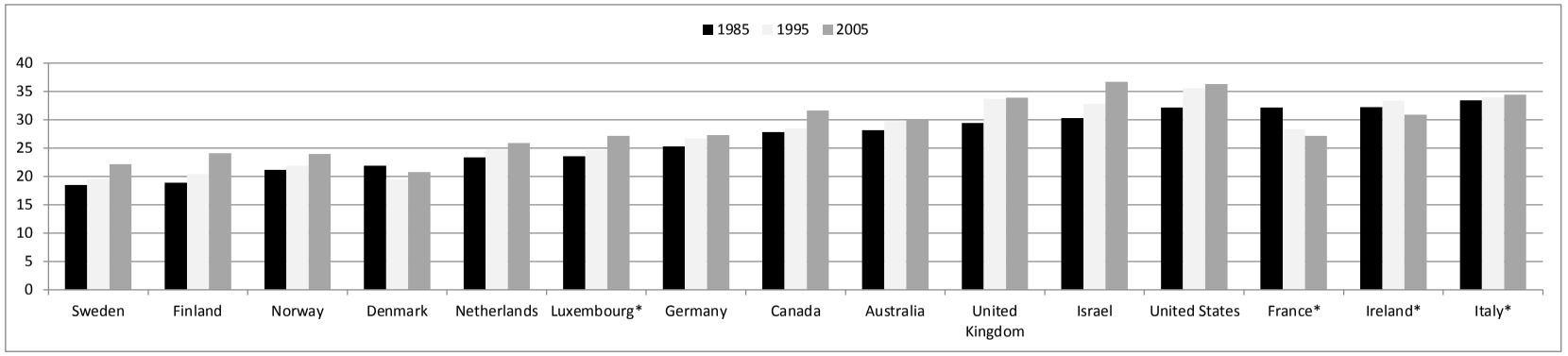
---

that international trade and capital mobility should have the opposite effect on the income distribution in developing countries and thus benefit unskilled workers and reduce inequality. Recent empirical evidence is, however, not in line with this prediction (for a survey see Goldberg and Pavnic, 2007): several Latin American and Asian developing countries experienced a considerable increase in openness toward international trade and capital markets during the 1980s and 1990s but also a rise in income and wage differences.

[11] The distribution is based on household incomes, which are assigned to individuals using an equivalence scale. More information on the income definition and the calculation of equivalence incomes is available in section 6.2.1.

[12] The Gini coefficient can take on values between zero (incomes are distributed perfectly equal) and 100 (one person has all income). Consequently, a greater Gini coefficient indicates a more unequal distribution.

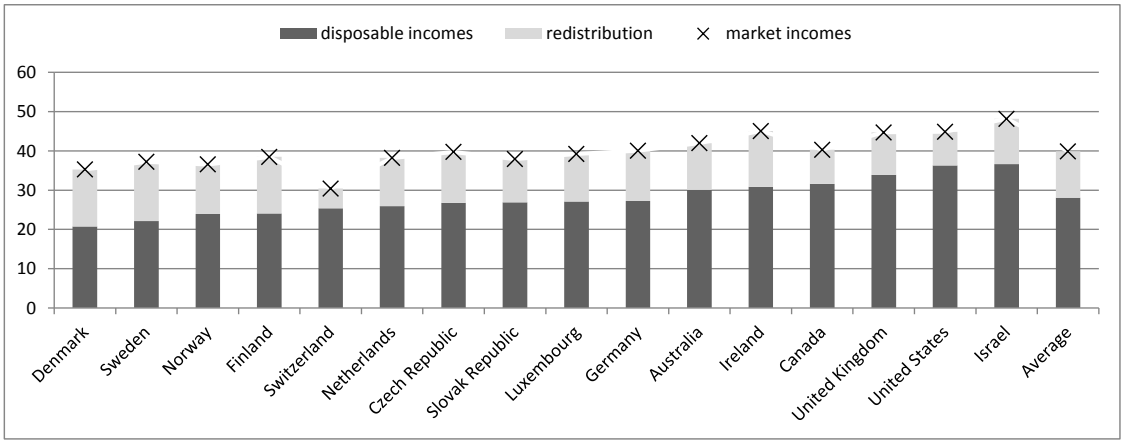
Figure 3.6: Distribution of disposable incomes (Gini coefficients, 1985-2005)



Gini coefficients on the distribution of disposable incomes among households with a working-age head (25 to 64 years). * denotes so-called "net income data sets" offering information only on disposable incomes but not on incomes before taxes and transfers. More information on the income definition is presented in Table 6.2 the exact years to which the income data refer is provided in Table A.2.
Data source: Own calculations based on micro data from LIS.

The reduction of market income dispersion is less in Switzerland (probably also due to a comparably low level of inequality), the United States and Canada, while redistribution is considerably higher in Scandinavian countries. In Denmark and Sweden, for instance, the Gini coefficients of disposable incomes are over 40 percents lower than the coefficients of the market income distribution.

Figure 3.7: Distribution of market and disposable incomes and redistribution (Gini coefficients, mid-2000s)



Gini coefficients on the distribution of disposable incomes (dark grey bar), market incomes (cross) and the share of the Gini coefficient of market incomes that is reduced by redistribution over taxes and transfers (light grey bar). Calculated for the distribution of incomes between households with a working-age head (25 to 64 years old). More information on the income definition is presented in Table 6.2 and information on the exact years to which the income data refer is available in Table A.2.
Data source: Own calculations based on micro data from LIS.

Figure 3.8 presents the changes in the distribution of disposable and market incomes as well as the extent of redistribution during a period of increasing international integration. Panel (a) shows the average yearly changes in the distribution of disposable incomes between the mid-1980s and mid-2000s.[13] In the first period (1985 - 1995) disposable income inequality increased on average by 0.16 Gini points per year. The income dispersion rose in all countries but Denmark. In particular the United Kingdom (0.5 Gini points) and Israel (0.23 Gini points) experienced a considerable rise in inequality during this period. The growth of disposable income inequality was, with an average annual increase of the Gini coefficient by 0.2 points, even more pronounced between 1995 and 2005. There was an uniform trend toward higher inequality in all countries whereby Canada, Finland, Israel, Norway

[13] The exact years for which income data is available and therefore the length of the periods to which the changes refer differ between the countries. To enhance the comparability and the interpretation, the changes of the Gini coefficients have been adjusted by the length of the period (i.e. the overall change for each period is divided by the number of years).

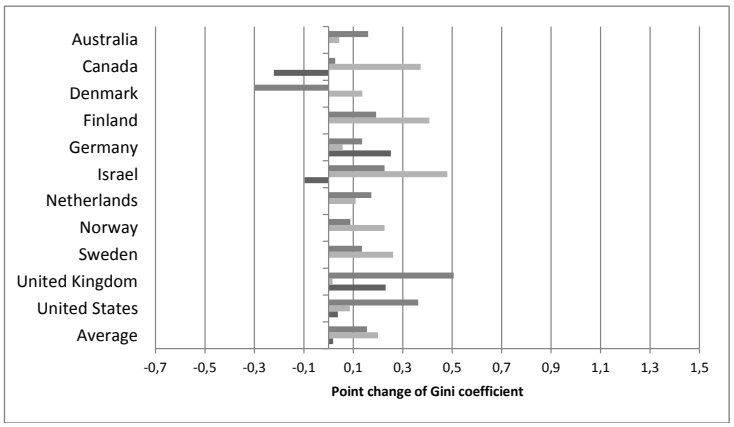
and Sweden experienced above average increases. For the last period (2005 - 2010) the pattern is less obvious. The average increase of the Gini coefficient for the five countries for which data is available is rather modest (about 0.02 points per year). Inequality remained stable in the United States, increased in Germany and the United Kingdom and declined in Canada and Israel.

Consequently, the main increase in inequality occurred between 1985 and 2005, in particular since the mid-1990s. Panel (b) of Figure 3.8 presents the average yearly changes of market income inequality. The rise in market income dispersion was particularly strong between 1985 and 1995. During that period the Gini coefficient rose on average by 0.44 points per year and all countries, except the Netherlands, experienced growing market income inequalities. The increase was highest in Finland (1.4 Gini points per year) and lowest, though still sizable, in Israel (0.21 Gini points per year). Between 1995 and 2005, the rise in market-induced income dispersion has been less pronounced with average yearly increases of the Gini coefficient by 0.09 points. Overall, rising Gini coefficients are reported for six countries, while five countries experienced a decline in market inequality. During the most recent period (2005 - 2010) the Gini coefficient of the five reported countries rose on average by 0.06 points yearly. This modest increase conceals, however, sizable and significantly different developments at the country level. In Germany, the United Kingdom and the United States the Gini coefficient increased by more than 0.2 points per year, whereby Israel and Canada experienced a likewise reduction of inequality.

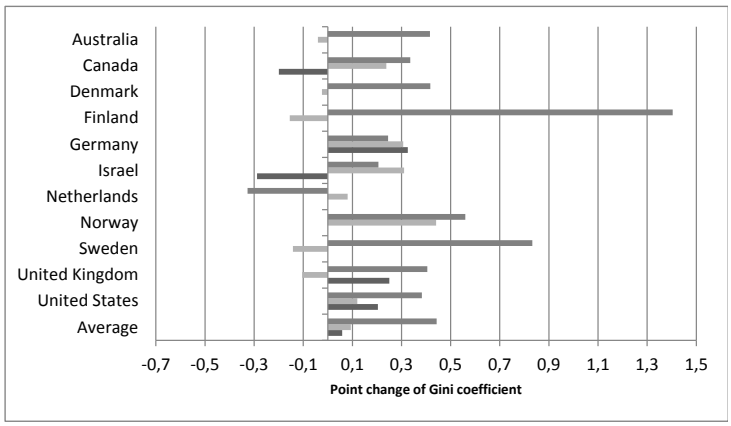
Finally, panel (c) depicts the development of redistribution through taxes and transfers. The picture is rather mixed: between 1985 and 1995 redistribution increased in eight countries and the share of market income inequality, which had been reduced via taxes and transfers, grew on average by 0.28 points per year. The period from 1995 to 2005 is on average characterized by a decline in redistribution (0.11 points lower reduction of the Gini coefficient of the market income distribution). The most recent period (2005-2010) does, on average, indicate no major changes in redistribution. This conceals, in particular, the large increase in income redistribution in the United States and a comparable decline in market inequality reduction in Israel.

In sum, the rising dispersion of disposable incomes between 1985 and 1995 mainly reflects large increases in market income inequality, which were only partly reduced by greater redistribution. From 1995 to 2005 the rising inequality was driven more by a reduction in redistribution than by considerable increases in market inequality.

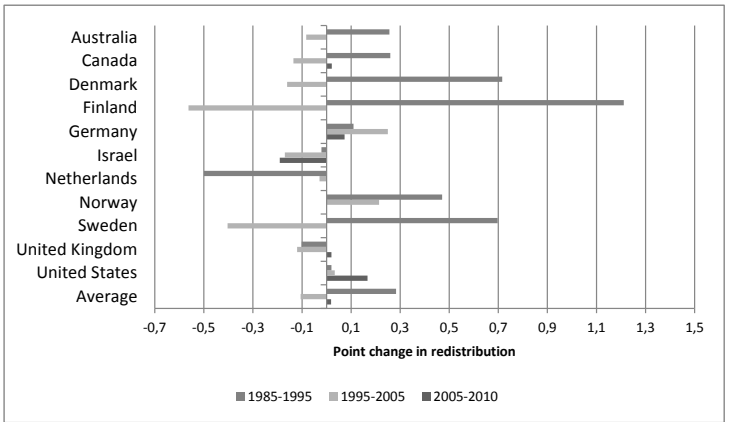
Figure 3.8: Development of income inequality (average annual changes in Gini-coefficients, 1985-2010)



(a) disposable incomes



(b) market incomes



(c) redistribution

Average annual changes in the Gini coefficients of disposable incomes (panel a), market incomes (panel b) and the share of market income inequality that has been reduced by redistribution (panel c). More information on the income definition is presented in Table 6.2 and information on the exact years to which the income data refer is available in Table A.2. *Data source:* Own calculations based on micro data from LIS.

Chapter 4

Empirical evidence on the relationship between globalization and income inequality

The descriptive analysis in chapter 3 suggests that OECD countries both experienced a rise in income dispersion and in exposure to international trade and capital mobility during the last decades. The question whether this common trend toward greater economic integration and income inequality reflects a causal relationship or is a simple coincidence has been the subject of several empirical studies. The empirical evidence provides rather mixed results concerning the impact of globalization on the income distribution in developed countries.

Some studies focus directly on the consequences of globalization on the income distribution in advanced economies. The findings by Alderson and Nielsen (2002), for instance, support the view that globalization contributed to the rising inequality in OECD countries. Based on data for 16 OECD countries from 1976 to 1992, the authors find that the outflow of direct investment capital and manufacturing imports from developing countries are related to a greater income inequality. A related analysis by Mahler (2004) does, however, not confirm the finding that globalization has a substantial effect on income inequality. Economic integration (i.e. the relevance of imports from less developed countries, financial openness and foreign direct investments) has no significant impact on the distribution of disposable incomes for a sample of 14 advanced economies between the early 1980s and 2000. Mahler concludes that domestic factors such as the strength of trade unions or wage coordination have been more relevant drivers of trends in income inequality.

Several authors argue that the focus on economic globalization may not be suf-

ficient to explain changes in the distribution of incomes. Emphasizing the relevance of different aspects of globalization, Dreher and Gaston (2008) use an index accounting for various dimensions of global integration (KOF Index). The basic reasoning for this approach is that economic integration is usually accompanied by a greater degree of social and political integration. Since these different dimensions of globalization might have opposing effects on the distribution of income, the mixed and often insignificant findings on the relationship between globalization and inequality may be explained by the one-sided focus on economic factors. The empirical analysis of Dreher and Gaston indeed suggests that overall globalization has increased income (and also partly wage) inequality in OECD countries between 1970 and 2000. Moreover, the disaggregation of the globalization index into its subcomponents economic, social and political integration, does not point at a significant effect of economic globalization on income inequality but rather suggests some influence of social and political integration. A related work by Bergh and Nilsson (2010) also employs the KOF Index to analyze the effect of globalization on the distribution of net incomes among households. Their findings are in line with those of Dreher and Gaston (2008): globalization has a positive and marginally significant impact on inequality.[14] Additionally, freedom to trade internationally (as measured by the Economic Freedom Index) is associated with a higher dispersion in the distribution of net incomes.

The considerable rise in wage dispersion and the decrease in employment of less educated workers in many industrialized countries since the 1980s has attracted the attention of economists who analyzed the determinants of these developments empirically. Most empirical studies focused on the role of trade in explaining the increase in wage inequality (surveys of this literature are provided by Richardson, 1995; Harrison et al., 2010; Kurokawa, 2010). The extensive literature on the impact of trade on wages often provides results which are inconsistent with the predictions of classical trade theories. Hence, many economists have concluded that not trade but other factors such as technological change favoring educated workers are responsible for the rise in wage inequality. The minor impact of international trade on the

[14] The disaggregation of the index reveals that this effect is mainly driven by social globalization. This subindex includes information, for instance, about international telephone calls, internet use and proxies for cultural proximity. This positive correlation between social integration and inequality, which matters especially for low- and middle income countries, may reflect changing social norms or interactions between the social dimension of globalization and a country's social policy. The latter has been emphasized by Dreher et al. (2008) who argue that a higher cultural proximity and an easier exchange of information leads to higher effects of capital mobility on fiscal policies.

distribution of wages might also be explained by the fact that alternative mechanisms (e.g. adjustments in the relative supply of educated workers) are widely neglected. Recently, several studies have analyzed new mechanisms through which trade can affect workers and income inequality (e.g. the role of labor market frictions). These studies indeed point at a larger role of international trade (e.g. the empirical studies surveyed in Harrison et al., 2010).

The inconclusive empirical evidence on the relevance of international trade and capital mobility for the income inequality may result from the conceptualization of most studies. The common approach of regressing measures of income distribution (e.g. Gini coefficients or earnings percentiles) on globalization indicators has several shortcomings (for a brief discussion see Atkinson, 2002). Such an analysis does not account for the possibility that international trade and capital mobility affect the income distribution through several channels. If these channels work in opposite directions and thus cancel each other (at least partly) out, then this may explain the often insignificant results.

A first attempt to analyze different channels through which globalization affects the wage distribution has been undertaken in a recent OECD study (OECD, 2011). Instead of relating the international integration of a country directly with the distribution of wage income among its population, this study provides separate tests for the impact of globalization on wage dispersion among full-time workers and on employment. The findings do not suggest a robustly significant relationship between international trade or capital mobility and the earnings dispersion or employment in OECD countries. Although this study does account for two different channels through which international integration can affect the personal wage distribution, it still neglects a number of alternative mechanisms and does therefore not provide comprehensive information on the distributional effects of globalization. In particular, possible supply responses are widely neglected.

Checci and Garcia-Penalosa (2010) stress the relevance of a broad analysis of the personal distribution of incomes encompassing various channels for our understanding of the determinants of inequality. Their study on the impact of labor market institutions is based on the idea that overall inequality can be decomposed into several components that serve as channels through which different labor market institutions influence income inequality. The authors propose an estimation approach consisting of two different steps. First, they estimate the effect of different kinds of labor market institutions on the wage differential, the labor income share and the unemployment rate. Second, they test how these variables alter the personal

distribution of incomes. Checci and Garcia-Penalosa find that labor market institutions have a significant impact on labor market outcomes and, thereby, also on the income distribution. Since institutions influence several labor market outcomes with potentially different implications for the personal income distribution (e.g. a higher union density reduces the wage differential but also raises the unemployment rate), the findings imply that a narrow focus on just one labor market outcome might deliver misleading results.

My study develops the basic idea of OECD (2011) further and combines the relationship between globalization and several labor market outcomes with an analysis of the impact of these factors on the personal distribution of market and disposable incomes (as suggested by Checci and Garcia-Penalosa, 2010). Beyond the combination of globalization effects on a set of labor market outcomes[15] and their transmission into inequality, I also enhance the two mentioned analyses by focusing on a broader range of transmission channels and providing information on the distribution of different types of incomes. In particular, I assume that the relative supply of human capital is affected by factors such as globalization and labor market institutions and is thus not taken as given.

The choice of transmission mechanisms is based on theoretical considerations and is discussed in chapter 5.

[15] Checci and Garcia-Penalosa (2010) find a negative (though not always significant) relationship between trade openness and income inequality. The authors do, however, include trade openness only in the analysis of the unemployment rate and, hence, ignore its impact through other channels.

Chapter 5

Identification of transmission mechanisms

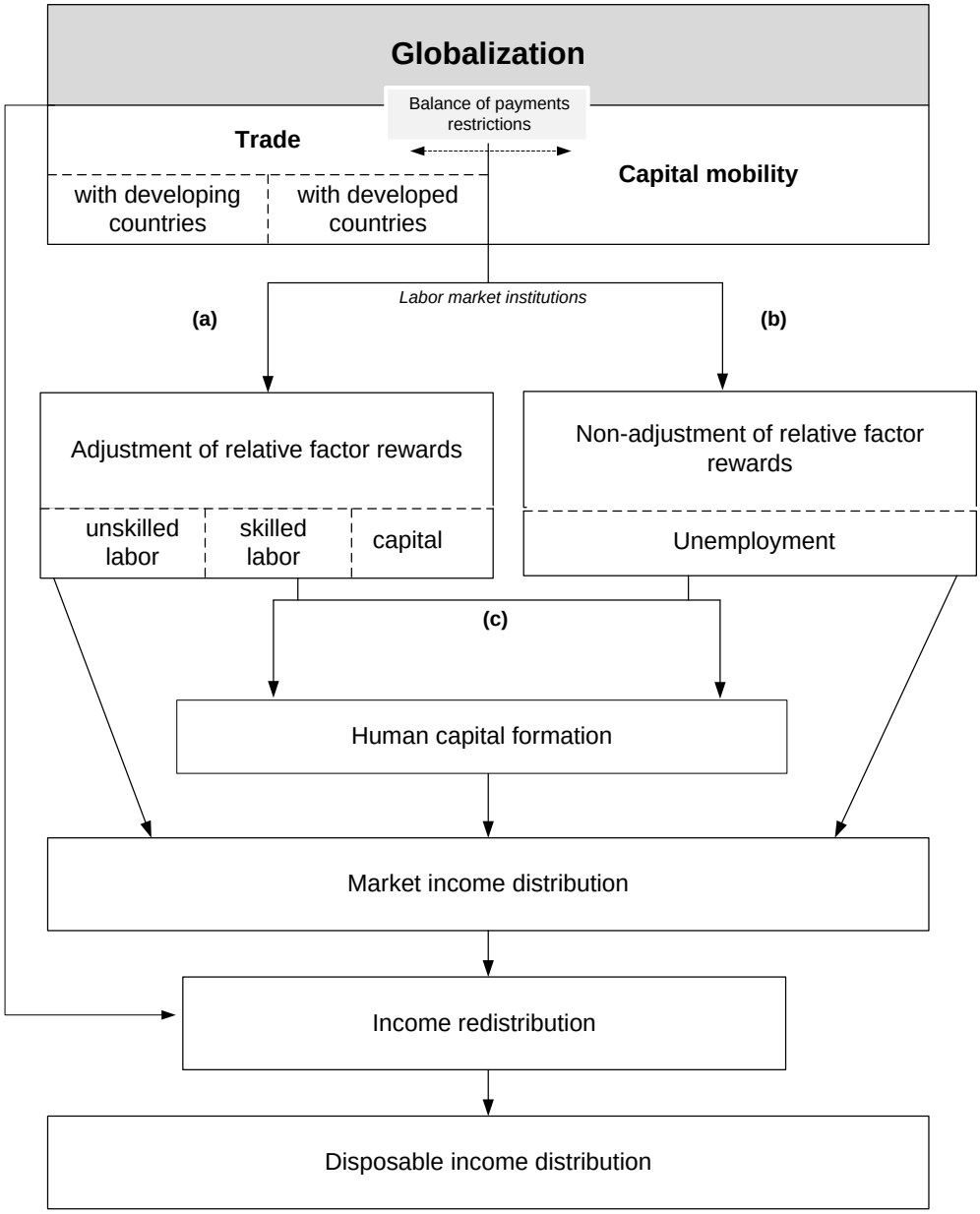
This chapter provides an overview about theoretical explanations regarding the relationship between globalization and economic inequality in advanced economies. The main objective is the identification of transmission mechanisms through which international trade and capital mobility may affect the income distribution. Figure 5.1 illustrates the relevant transmission channels and also serves as an outline of the subsequent discussion.

I focus on the exposure to international trade and capital mobility, which is expected to affect the functional distribution of incomes (i.e. the relative income of different production factors).[16] Trade affects the relative demand for capital, skilled and unskilled labor, while international capital flows change the relative supply of production factors.[17] With perfect competition on factor markets these changes in relative factor demand and supply should induce adjustments of the relative factor rewards. The relationship between international trade and capital mobility and the relative rewards of production factors is indicated by the arrow (a) in Figure 5.1.

[16] From an economy-wide perspective, international trade in goods and services and international capital flows are linked due to balance of payments restrictions. The international exchange of goods is accompanied by international capital flows (i.e. each import (export) requires a net capital inflow (outflow)) unless the goods exchange is reciprocal. While conceptually international trade and capital flows are two sides of a coin, the mechanisms through which they affect the income distribution differ. Thus, I discuss them separately.

[17] Besides capital mobility also labor mobility affects the distribution of incomes. International labor markets are less integrated than capital markets since cultural and language differences hinder the free movement of people. In addition, an empirical analysis of the effects of migration flows of workers with different levels of education for a panel of countries is not possible since the required data is not available for a sufficient number of countries and years. Hence, I focus on the impact of capital mobility though, in principle, the implications also apply to labor mobility.

Figure 5.1: Globalization and income distribution: identification of transmission mechanisms



Many advanced economies, however, face labor market frictions which impede the adjustments of wages. If the relative wages of unskilled workers do not respond to changes in relative labor demand, then the relative employment of unskilled workers will adjust (see channel (b) in Figure 5.1).

So far, the supply of production factors has been assumed to be inelastic. While this assumption is appropriate in the short-run, the relative supply of skilled workers (human capital) and capital should respond to changes in relative factor demand in the medium- to long-run (see channel (c) in Figure 5.1). Hence, changes in the skill premium or employment opportunities for well educated workers affect the returns to human capital investments and thus the supply of skills.

Globalization influences the functional income distribution via changes in the relative rewards, employment and supply of production factors. Conclusions about its impact on market income inequality (and thereby the distribution among individuals or households rather than production factors) require additional information about the actual ownership of production factors among different income groups.

Individuals are mainly interested in disposable incomes, which determine their consumption opportunities. The distribution of disposable incomes depends both on market incomes and redistribution via taxes and transfers. Consequently, a rise in market income inequality does not increase the inequality of disposable incomes by the same extent. The scope and effectiveness of public redistribution itself depends on a country's exposure to international trade and capital markets. The theoretical predictions regarding the effect of globalization on the welfare state are ambiguous. On the one hand, foreign competition limits the scope for taxation for national governments and the financing of the welfare state. On the other hand, the demand for redistribution and social insurance may increase as countries become more open.

5.1 Globalization and the functional income distribution

The subsequent section discusses the relationship between globalization and the functional income distribution. Based on a standard set of assumptions underlying most theories about international trade and capital mobility (such as perfect competition on goods and factor markets), the first part is devoted to changes in the relative factor payments. Afterwards, the assumption of perfectly competitive markets is relaxed by introducing labor market frictions. In this case, relative factor prices do not fully adjust but globalization changes the relative employment of

workers. Finally, the relative factor supply may respond to globalization induced shifts in relative factor demand.

5.1.1 Adjustments of relative factor rewards

International trade

For the discussion of the distributional consequences of international trade for industrialized countries, I distinguish between trade with other industrialized countries (*intra-industry trade*) and with developing countries (*inter-industry trade*).[18] In addition to the literature on trade in final goods also theories devoted to the effect of trade in intermediate products are reviewed.

To analyze the consequences of inter-industry trade for the distribution of incomes, economists have long employed either the Heckscher-Ohlin or the Ricardo-Viner ("specific-factors") model.[19] The Heckscher-Ohlin model explains patterns of trade in final goods between countries based on different factor endowments. Each country exports the good which uses the abundant factor of production intensively. Industrialized economies, which are capital or human capital abundant compared to developing countries, will thus specialize in the production of (human) capital-intensive goods. The lowering of the barriers to trade raises the demand for skilled relative to unskilled labor[20] and the relative demand for capital vis-à-vis labor in the industrialized countries. Hence, the owners of the abundant factor (i.e. skilled workers and capital owners) benefit from trade liberalization and experience rising real incomes while the real income of unskilled workers declines (Stolper and Samuelson, 1941).[21]

One basic assumption of the Heckscher-Ohlin model is that production factors are fully mobile between industries in each country (though internationally immobile). In contrast to this, the Ricardo-Viner ("specific factors") model takes a short-term perspective and presumes that at least one factor can be used for production only

[18] Unless mentioned otherwise, the theories of international trade introduced in this section assume that the production factors are internationally immobile.

[19] The impact of trade on the distribution of wages can be also analyzed based on a Ricardian approach (i.e. incorporating technological differences as in Johnson and Stafford, 1999).

[20] In accordance with the literature, the expressions human capital and skilled labor are used interchangeably.

[21] This strong version of the Stolper-Samuelson theorem is based on the assumptions of the standard Heckscher-Ohlin model focusing on two countries, two goods and two factors. The basic distributive implications usually hold also in more general settings such as the Heckscher-Ohlin-Vanek model covering many countries, goods and factors as long as the number of goods does not exceed the number of factors (e.g. Feenstra, 2004).

in one specific industry.

In a simple version, this model covers two sectors each using both labor and capital for production. Capital is supposed to be fully mobile between both sectors but the supply of labor is fixed in each industry, i.e. reflecting different skill requirements for workers in each sector. In this framework, trade liberalization raises the rate of return on capital,[22] it increases the real wage of workers in the sector, in which the country has a comparative advantage and it lowers the real wage of workers employed in the sector where the country has a comparative disadvantage. In industrialized countries, unskilled workers tend to be disproportionately more often employed in import-competing industries, in which the country does not have a comparative advantage. Thus, the skill premium will rise.

In sum, standard trade models suggest a positive effect of trade in final goods on income inequality as long as production factors which are abundant or specific to export industries received higher payments before trade liberalization. This is, however, often not confirmed by the data (a recent discussion is provided by Kurokawa, 2010 and Harrison et al., 2010). In contrast to the predictions of the theories discussed above, much of the change in the relative wage and employment of skilled and unskilled workers is driven by within-industry shifts rather than of reallocations between industries. Hence, rising wage inequality cannot be explained by changes in the production structure (i.e. the weight of certain sectors in GDP) but are more likely a consequence of within-industry shifts in the relative demand for unskilled labor. Given this inconsistency, many economists focused on skill-biased technological changes instead of international trade as an explanation for rising wage inequality (Berman et al., 1994). A study by Bernand and Jensen (1997), however, indicates that trade might also affect wages through within-industry changes of labor demand.

An attempt to explain these changes of relative labor demand within industries is based on the role of trade in intermediate goods. Improvements in transportation and communication technology (especially since the 1980s) allowed a stronger disintegration of the production process (or a *"slicing-up the value chain"* as stated by Krugman, 1995). This has induced a boom in offshoring or outsourcing of production activities with firms taking advantage of international differences in factor prices.

Feenstra and Hanson (1996) introduce a model of trade in intermediate inputs which indicates that the offshoring of production activities reduces the relative wages

[22] The rewards to capital as the mobile factor of production will increase by less than the price of the export good. Consequently, the effect on the real interest rate depends on the relative consumption regarding the import and export good.

of unskilled workers by lowering the relative demand for this group of workers within each industry.[23]

The model incorporates an industrialized and a developing country, which produce each one final good assembled from intermediate inputs. The production of each input requires unskilled and skilled labor as well as capital. The skill-intensities (i.e. the amount of skilled relative to unskilled labor required for production) differ for the intermediate inputs. Moreover, the wage of skilled relative to unskilled labor and the real interest rate are supposed to be lower in the industrialized than in the developing country.[24] Consequently, the unit costs of production of each input will, depending on its skill-intensity, differ between the two countries. Based on a cost minimization calculus, firms locate the production of inputs with high skill-intensity in the industrialized country and inputs which require relatively more unskilled workers are produced in the developing country. Hence, there exists a unique level of skill-intensity below which the unit costs of production for the intermediate inputs are lower in the developing country and which are thus produced in this country. The industrialized country will specialize on the production of all intermediate inputs with a skill-intensity above this critical value since its unit costs of production are lower than in the developing country.

If now the capital stock grows (e.g. due to capital mobility) or technology improves (i.e. neutral technological progress) in the developing relative to the industrialized country, then the costs of production will decline in the developing but rise in the industrialized country (Feenstra and Hanson, 1996).[25] Due to this relative decline in general production costs in the developing country, the critical value of skill-intensity above which the industrialized country has lower unit costs increases (i.e. the developing country has now a relative cost advantage for intermediate goods with a higher skill intensity than before). This induces a further relocation of production activities and the skill-intensity in the production of inputs increases in both countries. The relative demand for unskilled labor therefore declines in both countries. This will, ceteris paribus, lower the relative wage of unskilled workers.[26]

---

[23] Thus, trade in intermediates has the same impact on wages and employment as skill-biased technological change (Feenstra, 1998).

[24] This is a reasonable assumption if the industrialized country is skilled labor and capital abundant. If capital is mobile between the two countries, then it will relocate to the developing country because of the higher rents.

[25] Capital movements from the (capital-abundant) industrialized to the (capital-scarce) developing country increase the interest rate in the former and lower it in the latter country. This change in the costs of capital leads to a general increase in the unit costs of production in the industrialized country and a decline in the developing country.

[26] This result is based on the assumption that capital movements only affect the general pro-

A related approach focuses on tradable tasks performed by workers of different skill levels. These "trade in tasks" models rely on the basic idea that the production process of each good consists of several tasks which are performed by each factor of production.[27] The assignment of production factors to certain tasks (i.e. steps in the production process) is however not fixed. Technological improvements make it possible that tasks, which have previously been performed by labor are conducted by machinery (usually routine tasks) or are produced abroad.[28] Grossman and Rossi-Hansberg (2008) analyze based on a Heckscher-Ohlin framework how a decline in the costs of offshoring affects workers with different skill levels. In contrast to the predictions by Feenstra and Hanson (1996), the offshoring of tasks performed by unskilled labor does not necessarily lower the domestic wages of unskilled workers. A decline in offshoring costs increases the effective supply of unskilled labor in the industrialized country and lowers the relative price of the unskilled labor-intensive good. Furthermore, it induces cost savings (of already offshored tasks) that are greater in the unskilled labor intensive sector and leads to an expansion of this sector. While the first two effects result in a fall of the relative wage of unskilled workers, the third works in favor of this group.

The theories discussed above allow only statements about the distributional consequences of trade between countries with different factor endowments (e.g. industrialized and developing countries). For most industrialized countries, however, a considerable part of trade relationships comprises the exchange of similar goods. Attempts to explain this intra-industry trade are usually based on the existence of increasing returns to scale in the production of differentiated goods (as in the model developed by Krugman, 1980). The underlying idea of these models of monopolistic competition is that consumers have a "taste for variety" (i.e. prefer to consume a broad range of varieties of a differentiated good). Each firm produces one variety of this good whereas the production technology is characterized by increasing returns to scale. The preferences for the consumption of a broad range of varieties implies that many firms should each produce a small quantity of a variety of the differentiated good. In the presence of scale economies, however, it would be efficient that few firms produce larger quantities and thereby serve the whole market at lower av-

duction costs but do not have a differential impact on the two types of labor (i.e. the degree of complementarity to capital is the same for skilled and unskilled labor).

[27] This tasks approach differs from the canonical production function which does not allow to differentiate between the questions *which* factors are used in the production and *what* their role is (i.e. which services does each factor provide).

[28] A detailed discussion of the task approach and its conceptualization is provided in Autor (2013) and Acemoglu and Autor (2010).

erage costs. Consequently, a trade-off exists between the supply of a greater number of varieties and the utilization of scale effects. In this set-up, trade has the same implications as an increase in market size. Firms can serve the foreign market and are therefore able to produce and sell a larger quantity of their varieties to utilize scale effects. At the same time, more varieties are available for domestic consumers because they can also consume varieties produced by foreign firms. Krugman (1980) presumes that firms are homogeneous. Recent works, however, relax that assumption and allow firms to differ in their productivity and other characteristics. These models are a good starting point to analyze the implications of intra-industry trade for wage inequality.

The model by Melitz (2003) incorporates firm heterogeneity into Krugman's (1980) model of trade under monopolistic competition and increasing returns. The firms differ in their productivity and thus have different marginal costs of production. Depending on their level of productivity, firms decide whether to produce or not.[29] In an open economy firms could also serve the foreign market but exporting requires an additional fixed investment.[30] Due to these costs only the most productive firms will export. Compared to the autarky situation domestic firms incur a loss in market shares after the economy opens to trade since foreign firms also serve the domestic market. This induces the least productive firms to leave the market.[31] Hence, the exposure to trade raises the overall productivity in the industry and leads to a reallocation of market and profit shares among firms. Only exporters as the most productive firms can (more than) compensate the loss of domestic sales with their exports. This standard approach assumes identical workers and competitive labor markets in which all workers will receive the same wage. This model can therefore not be employed to analyze the effect of trade on wage dispersion.

Recently, several modifications of heterogenous firm models have been introduced which imply that trade leads to a wage differential between exporting and non-exporting firms. In principle, these heterogenous firm models could also explain changes in the rewards of labor relative to capital, the focus of these recent models

[29] The firms are ex ante identical. After a payment of fixed entry costs, which are afterwards sunk, firms enter the market and learn about their (randomly assigned) level of productivity. Depending on their productivity, firms decide whether to exit or stay in the market.

[30] To enter the export market, both a sunk fixed investment and per-unit shipping costs incur.

[31] The production of each variety and the sunk fixed investments to enter the market and export require labor. Thus, all domestic firms compete on domestic labor markets. After the economy opens to trade the more productive firms will enter the export market and new firms enter the market because of increasing profit opportunities. This raises the demand for labor, which is inelastically supplied, and increases the real wage. The least productive firms cannot afford the higher wages and are forced to exit the market.

is, however, on the relative wage of unskilled workers.

One way of incorporating wage differentials into heterogenous trade models is based on the assumption that firms' productivity is related to the skill-intensity of their production. Yeaple (2005) extents the standard heterogenous-firms models by combining the use of different technologies by firms and workers with heterogenous skills.[32] More productive exporting firms use a technology that favors highly skilled workers.[33] Falling trade costs[34] make exporting and therefore investments into the advanced technology more attractive. This raises the relative demand for skilled workers in all industries and, hence, also their relative wage.[35]

In a related study, Vannoorenberghe (2011) also assumes that exporters produce more skill-intensive goods than the less productive and purely domestic firms. A reduction of trade costs induces a reallocation of resources between firms because skill-intensive exporters expand and the least productive firms, which use relatively more unskilled workers, leave the market. The relative demand for unskilled workers and also their relative wages decrease.[36] Harrigan and Reshef (2011) introduce a

[32] In contrast to Melitz (2003) who incorporates firm heterogeneity into a trade model by randomly assigning different productivity levels to firms, Yeaple (2005) allows firms to chose both from competing technologies and workers with different skills.

[33] The more advanced technology has lower unit costs of production but requires the payment of additional fixed costs. This technology is profitable for large firms. Moreover, as skilled workers have a comparative advantage in that technology, they are intensively used by exporting firms.

[34] A reduction of trade costs could be due to trade liberalization (e.g. lower tariffs) or a decline in transaction and information costs.

[35] Trade liberalization increases the nominal wages of the most skilled workers in the economy, does not affect the nominal wages of the least skilled workers who are employed in the non-tradable sector and lowers the nominal wages of moderately skilled workers. This is due to the greater use of the high-skilled technology, which is required to produce the export good, instead of technologies in which moderately-skilled workers have a comparative advantage but that cannot be used to produce the export good. Moderately skilled workers using this technology suffer wage losses after the contraction of their industry because many of them work in the non-tradable sector where they are less productive and therefore earn lower wages. Due to a reduction in prices, the real incomes of both the most and least skilled workers will rise. The impact on the real income of moderately skilled workers is ambiguous since they face a reduction in nominal wages but also benefit from lower prices of the tradable good.

[36] The expansion of skill-intensive exporting firms and thus the higher demand for skilled workers and the release of unskilled labor by firms leaving the market both lower the relative wage of unskilled workers. A third channel through which falling trade costs can affect the skill premium is the relative skill-intensity of new firms which enter the export market. Their impact on relative wages is however ambiguous and depends on the initial trade costs. If the initial trade costs are high, then only productive firms with above average skill-intensity enter the export market and the relative demand for unskilled labor further decreases. If however, the initial level of trade costs is low, then firms entering the export market are relatively unskilled-intensive and therefore increase the relative demand for unskilled labor. But this effect cannot overcompensate the first two and, consequently, trade liberalization lowers the relative wage of unskilled workers.

skill-biased technology into a heterogenous-firms framework and show that falling barriers to trade depress the wage of unskilled workers.

Instead of assuming that exporters and purely domestic firms differ in their relative demand for skilled versus unskilled labor, several studies combine heterogenous-firm models with a comparative advantage framework (i.e. based on the combination of differences in the relative factor endowments between countries and different factor intensities between industries).

Bernard et al. (2007) show that in this framework, falling trade costs lead to a rise (fall) in the relative nominal wage of the abundant (scarce) factor.[37] The effects of a reduction in barriers to trade on real wages also depend on changes in goods prices, which are affected through different channels. First, as in Melitz (2003) trade increases the average productivity as the least productive firms are forced to leave the market and more productive firms gain market shares. Second, domestic consumers gain access to foreign varieties of the differentiated goods. This increases the competition as the number of available varieties rises and thus lowers the prices (as in Krugman, 1980). Third, the average firm size rises which again reduces the number of domestic varieties and increases the prices. Overall, the impact of trade on prices and therefore real wages is ambiguous. If the impact of rising productivity and import-competition on prices is stronger than the effect of a reduced domestic supply of varieties, then the price reduction may even overcompensate the nominal wage loss of the scarce factor. Moreover, trade liberalization will result in substantial job turnover. While more jobs are created than destroyed in comparative advantage industries, the comparative disadvantage industries face a net job destruction.

A related study by Burstein and Vogel (2010) also incorporates firm heterogeneity into a comparative advantage model. That approach allows an analysis of the effects of trade liberalization on the reallocation of production factors both within and between industries. A reduction of trade costs induces a shift of resources in favor of the comparative advantage industry and increases the relative demand for the factor used intensively in this sector. The relative wage of skilled workers will rise in the skill-abundant (presumingly industrialized) country. In addition to the change in relative factor demand driven by between-industry reallocations, within each industry the more productive (and by assumption also more skill-intensive) firms expand and the relative demand for skilled workers rises in every country (i.e. regardless of the relative factor endowments).

[37] This is a result of the comparative advantage and based on the mechanism proposed by Stolper and Samuelson (1941).

Overall, international trade is expected to affect the relative factor rewards and thus the functional income distribution as summarized in hypothesis 1.[38] The impact of trade on relative factor rewards at the country-level can be driven by shifts in the factor demand both between and within industries and be a consequence of either inter- or intra-industry trade.

Hypothesis 1 *A greater exposure to international trade should reduce both*
(a) the wages of unskilled relative to skilled workers and
(b) the rewards of labor relative to capital in the industrialized country.

International mobility of capital

The liberalization of the capital markets which started in the 1970s has induced a rise in international capital flows (see Figure 3.4). International capital mobility should change the amount of capital available for domestic production and thereby affect the rewards of the production factors capital, skilled and unskilled labor.

The implications of the lower barriers to international capital movements can be illustrated based on a simple two country model covering an industrialized and a developing country (see Figure 5.2 (a)).[39] Before the liberalization of international capital markets, the capital stock available in the industrialized country exceeds that in the developing country (marked by a star). In Figure 5.2 (a), this initial situation is characterized by the allocation X_0. Due to the diminishing marginal product of capital, the real interest rate (r) is lower in the capital-rich industrialized than in the developing country (i.e. $r < r^*$). If capital is fully mobile between the two countries, then it moves from the industrialized to the developing country to receive higher returns. The capital flows reduce the capital stock available for domestic production in the industrialized country and increase the capital stock in the developing country. This reallocation will continue until the marginal returns are equalized in both countries (i.e. capital earns the same real interest rates), which is the case at point X_1.

The distributional consequences of the relocation of capital for capital owners and labor (as the internationally immobile factor) can be summarized as follows:

[38] The hypotheses in this chapter provide a starting point for the empirical analysis, which focuses only on industrialized countries. Hence, the influence of globalization on the income distribution in developing countries is neglected. Neoclassical theories suggest that a greater exposure to international trade and capital mobility should have the opposite effect on developing than on industrialized countries. The difference is, however, less obvious for trade in intermediate goods or in the presence of heterogenous firms.

[39] A detailed discussion of this simple model is also provided in Ruffin (1984).

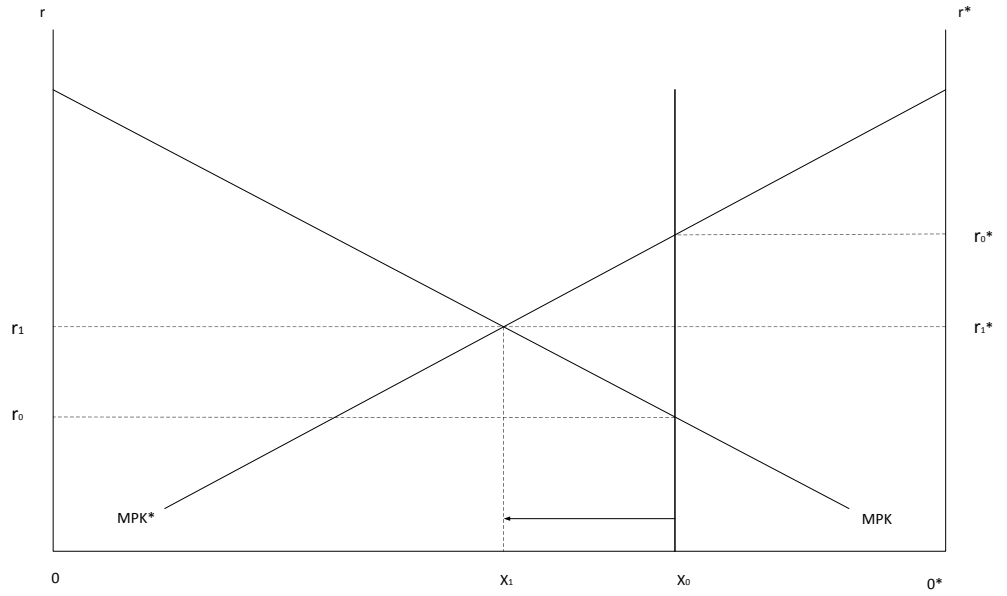
first, capital owners in the industrialized country gain from rising interest rates (i.e $r_1 > r_0$), while the returns to capital decline in the developing country (i.e $r_1^* < r_0^*$). Second, the changes in the capital stocks affect the productivity of labor as a complementary factor of production. The productivity of labor increases if more capital per worker is available (i.e. the capital intensity ($\frac{K}{L}$) is higher). Due to the changes in the capital stocks, the productivity and the wages of workers rise in the developing country and decline in the industrialized country. Hence, in initially capital-rich industrialized economies, the liberalization of capital markets benefits capital owners but hurts workers.

Vaubel (2005) stresses that the extent to which workers in industrialized countries lose from international capital mobility depends on the assumption that both countries are symmetric. It is reasonable to make a distinction between workers based on their skill levels. Moreover, it is assumed that the supply elasticity of human capital (or skilled labor) is higher in the industrialized than in the developing country. In this case, the marginal productivity of capital is less responsive to changes in the capital endowment, since the better availability of skilled labor as the complementary factor of production mitigates the diminishing returns to capital. The curve of the marginal product of capital is thus less steep in the industrialized than in the developing country. This case is illustrated in Figure 5.2 (b). The losses of labor will be lower in this asymmetric case, while capital owners gain less than in the symmetric case.

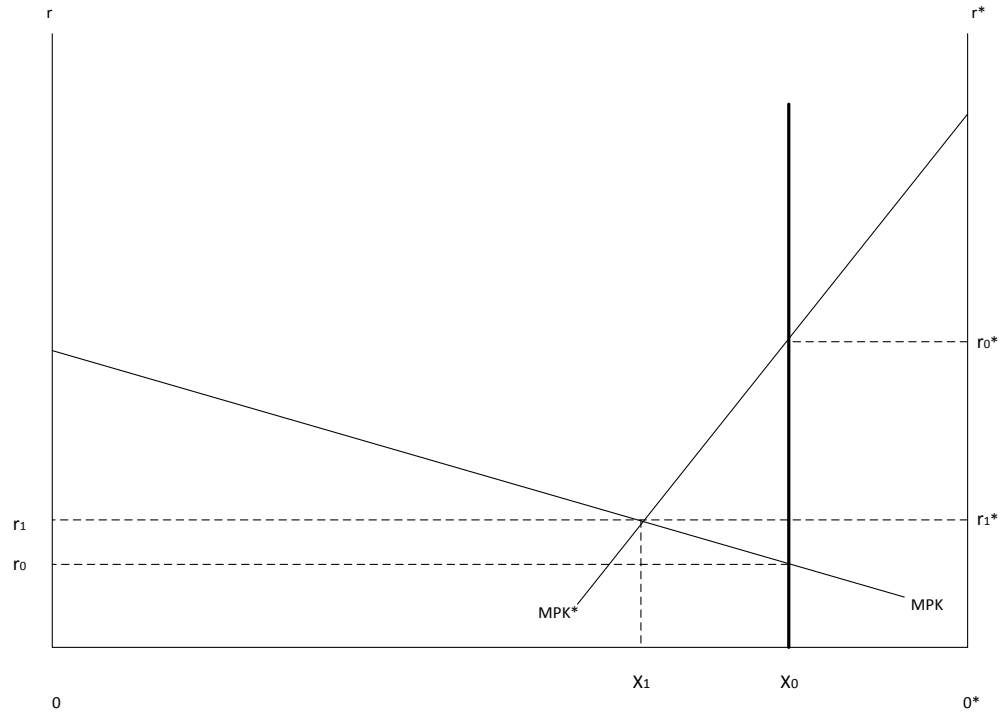
If the developing country is unskilled labor abundant compared to the industrialized country, then the flow of capital will induce an expansion of the production of the unskilled labor-intensive good. Moreover, the decline in the capital costs in the developing country reduces the costs of production in this country. This increase in relative competitiveness intensifies the import-competition in the unskilled labor-intensive sector in the industrialized country. The additional imports lower the demand for unskilled workers and thus their relative wage will fall. Despite similar effects on the relative wages of unskilled workers in industrialized countries, the impact of capital mobility on absolute wages differs from that of international trade. The wages of both skilled and unskilled workers decline but unskilled wages fall more than skilled wages. While trade raises the wages for well educated workers in the OECD countries, capital movements reduce them.

An analysis of the conventional gains from capital mobility, which are a result of international differences in interest rates, does not require a distinction between different types of capital flows. In principle, every (private) capital flow should af-

Figure 5.2: Consequences of capital mobility



(a) symmetric two country case



(b) asymmetric two country case

Notes: Based on Vaubel (2005), p.146f.

fect a country's capital stock and, hence, relative factor payments. Many studies on capital mobility, however, focus solely on foreign direct investments (FDI) and neglect other types of private capital flows. One reason for this has been the perception that different kinds of international investments have different implications, for instance, regarding the use of capital and its efficiency. Ownership is more dispersed among portfolio investors who hold smaller shares of foreign firms than FDI investors. Thus, Razin (2003) argues that attempts to improve a firm's management under portfolio equity ownership will be hampered by a free-riding problem since an investor who engages in improving management quality will not enjoy the full benefits but any measure will be equally beneficial to all investors. Consequently, the incentive to monitor and improve the management of the firm is lower for a portfolio than for an FDI investor. Due to a probably superior management, FDI firms might be more productive and this may also lead to higher wage payments (as indicated by the findings of heterogenous-firms trade models).[40] A higher productivity of multinational compared to purely domestic firms may be necessary since activities in foreign markets by multinational firms are likely associated with additional costs, which local competitors do not bear. Insofar, multinational firms must have a comparative advantage to survive in a foreign market (for a discussion of this issue see Greenaway and Nelson, 2001). This effect may be reinforced through the transfer of foreign technology and know-how to the firms located in the host country. Besides these arguments, it may be reasonable to distinguish between the international mobility of financial and real capital since the latter might be subject to more political restrictions and controls (this point has been raised by Schulze and Ursprung, 1999).

The theoretical expectations regarding the impact of international capital mobility on the relative payments to different production factors are summarized in hypothesis 2.

Hypothesis 2 *The lowering of barriers to international capital movements*
(a) increases the returns to capital relative to labor and
(b) lowers the wage of unskilled relative to skilled workers.

[40] Helpman et al. (2004) propose a theoretical model of heterogenous-firms indicating that only more productive firms produce for foreign markets. Moreover, those firms with the highest productivity serve foreign markets through foreign production facilities (FDI) while the others export their products. This model does, however, not allow to draw any conclusions about the impact of different kinds of foreign investments (such as portfolio investments versus FDI) on firms' productivity and wages but indicate that FDI might be related to firms' economic success and thus affect the wage distribution.

Empirical evidence on globalization and relative factor prices

An extensive empirical literature exists, which - due to the coincidence of rising trade and wage dispersion in many industrialized countries since the 1980s - elaborates on the relationship between international trade and wage inequality. The empirical evidence on this issue is, however, ambiguous (a literature review is provided by e.g. Freeman, 1995; Greenaway and Nelson, 2001).

Several studies analyze the consequences of international trade based on estimations of the relative factor content of imports and exports and, hence, approximate the changes in relative labor demand due to trade. Whereas some authors (e.g. Wood, 1995, 1998) find that international trade is a major cause of the reduced demand for unskilled workers in the industrialized countries, others observe significant but modest effects of trade on relative wages in advanced countries (e.g. Borjas et al., 1992). A different approach[41] has been chosen by several trade economists who analyze whether the data supports the mechanisms suggested by the Heckscher-Ohlin model. Several inconsistencies are detected in the data and, hence, the authors argue that trade cannot explain rising wage inequality. One basic issue is based on the development of relative product prices. The chain of causation suggested by the Stolper-Samuelson mechanism runs from trade-induced shifts in relative good prices to changing relative factor rewards. Lawrence and Slaughter (1993) do not find an increase in the relative prices of skill-intensive goods in the U.S. and therefore conclude that trade could not explain the rising wage differential. Sachs and Shatz (1994), however, exclude computers, which distort the price calculations due to massive price reductions, and come to a different conclusion that is in line with the predictions by trade theory. A further objection raised against the relevance of international trade is that the average skill-intensity has increased in all industries, which is not suggested by the Stolper-Samuelson theorem.[42]

Therefore, many economists conclude that not international trade but technological change in favor of human capital must be the explanation for rising wage differentials in many industrialized countries. This distinction between international trade and technological change is, however, rather artificial as both are highly

[41] The empirical studies conducted during the 1990s usually employ one of the following three approaches to elaborate on the relationship between international trade and labor market outcomes: factor-content, price or computable general equilibrium studies. Factor-content studies calculate (based on a set of very restrictive assumptions as e.g. critized by Wood, 1995) the amount of labor incorporated in imported and exported goods. The difference between the relative amount of (skilled) labor embodied in traded goods, then, indicates how trade affects relative labor demand and therefore wages.

[42] This issue and its implications has already been discussed on page 27.

interrelated. On the one hand, improvements in transportation and communications technologies have fostered the international exchange of final and intermediate goods. On the other hand, the greater competitive pressure resulting from trade with low-wage countries such as China has induced defensive innovation in import-competing industries (e.g. Van Reenen, 2011). Wood (1998) reports that both technological change and trade with developing countries matter for the rise in relative demand for skilled labor.[43] Koeninger et al. (2007) find a positive relationship between import penetration and wage dispersion in OECD countries between 1973 and 1998 after controlling for differences in domestic labor institutions. The effect is more pronounced if the authors focus only on imports from non-OECD countries. Moreover, R&D intensity (as a proxy for technological change in favor of skilled workers) fails to have a significant impact.

Newer developments since the 1990s are the expansion of trade with low-wage countries such as China and the vertical disintegration of the production process through offshoring and outsourcing. This leads to a stronger specialization of low-wage countries in the production of (unskilled) labor-intensive goods or components in otherwise skill- or capital-intensive products (e.g. computers). Using data for the U.S. from 1979 to 1990, Feenstra and Hanson (1999) analyze how outsourcing and high-technology capital affect relative wages. The estimates indicate that investment in high-technology capital (e.g. computers) account for 35 percent of the increase in the wage differential, while outsourcing (i.e. imports of intermediate inputs) explains 15 percent of this rise. Geishecker and Görg (2007) test empirically how international outsourcing affected wages of German workers between 1991 and 2000. For that purpose, the authors combine micro-level data for workers with information about outsourcing activities of the industry in which they are employed. The regression results suggest that imports of intermediate inputs increase the wages of high skilled workers but reduce the wage of low skilled workers. This finding is remarkable since outsourcing has widened the skill premium despite a highly regulated German labor market and the absence of a considerable rise in the wage differential at the aggregate level as experienced in the U.S..

Empirical evidence on the impact of international capital movements on the distribution of wages is limited. Moreover, most empirical studies are concerned with multinational firms and offshoring activities through FDI.[44] A recent empirical

[43] He concludes that technological changes explain most of the increase in the relative demand for skilled labor during the 20^{th} century but international trade is responsible for the acceleration in its growth since the 1980s.

[44] Offshoring activities, i.e. firms' investment in foreign plants relate to international capital

analysis based on a panel of OECD countries (OECD, 2011) indicates that fewer restrictions toward FDI and a greater stock of outward FDI are associated with greater wage inequality.

5.1.2 Non-adjustment of relative factor rewards and unemployment

So far, the predictions regarding the impact of globalization on the functional income distribution have focused only on changes of the relative rewards of production factors. This would be sufficient if the relative factor prices were flexible and fully adjusted to shifts in the relative factor demand or supply. This is the case if factor markets are perfectly competitive. In many industrialized countries, however, several market imperfections exist which prevent a full adjustment of the relative factor prices and thereby market clearing.[45]

Globalization lowers the relative demand for unskilled workers and thus induces a downward pressure on the relative wages of unskilled workers. The prevalence of labor market rigidities may hinder the relative wages from responding to these demand shifts. If the wages of unskilled relative to skilled workers are fixed at some level exceeding the equilibrium wage (e.g. because of minimum wages), then this leads to an increase in involuntary unemployment among unskilled workers. Consequently, the change in the relative labor demand will affect the income distribution either through a rising wage dispersion or a shift in the relative employment of workers.[46]

Role of rigid labor market institutions

Several theoretical works shed light on the effects of international trade and capital mobility on employment. A first group of studies focuses on inter-industry trade

movements. At the same time, the production of intermediate inputs abroad raises trade volumes as these inputs are imported and used for domestic production. Hence, the rise in imports of intermediate goods and outflows of capital are two sides of a coin.

[45] Although imperfections in any good or factor market may result in a situation in which factor prices are not fully flexible, labor market imperfections that are existent in many advanced economies are probably the most prominent and relevant source of market failure. Hence, the main focus of the subsequent discussion is on labor market rigidities.

[46] A popular perception is that the different adjustments of either relative wages or employment refer to the American (flexible labor market) and the European (rigid labor markets) case (e.g. Johnson and Stafford, 1999). This is, however, an oversimplification as indicators of wage flexibility (e.g. the overall responsiveness of wages to the level of unemployment) do not differ much between Europe and North America. Moreover, labor market institutions vary considerably between European countries (Nickell, 1997).

and compares the labor market outcomes for different institutional settings.

Krugman (1995) analyzes the wage and employment effects in advanced economies that result from trade with less developed countries with a specific focus on the role of labor market institutions. He performs his analysis of the consequences of trade separately for economies with different degrees of labor market flexibility and compares the impact of trade liberalization in these different setups. His calculations suggest that the adverse labor market effects of inter-industry trade are rather small with flexible labor markets but can be substantial in the presence of labor market rigidities.[47] In a related work, Davis (1998) chooses a theoretical framework in which the world economy consists of a country with fully flexible wages and another with a binding minimum wage. In a Heckscher-Ohlin approach, free trade tends to raise unemployment in the economy with rigid labor markets and to increase wages in the other. If both countries start trading with a third economy (e.g. a less developed country), then the import-competion will increase in the rigid economy (due to differences in the relative good prices resulting from the minimum wage) but not affect the flexible market.

A recent strand of literature uses heterogenous-firms models combined with imperfect labor markets. For instance, Davis and Harrigan (2007) introduce efficiency wages which are paid at the firm-level into a standard Melitz-model. To increase workers' costs of a job loss and thus shirking, firms pay higher wages. Moreover, firms pay different wages as they differ in their ability to monitor workers and to detect shirking. In this framework, trade liberalization destroys jobs with high marginal cost of production and those paying high efficiency wages. A related work by Egger and Kreickemeier (2009) incorporates workers with a preference for fair wages into a general equilibrium model with heterogenous-firms. The wage workers consider to be fair depends on the firms' productivity (i.e. is motivated by a rent-sharing motive) and workers adjust their effort on the wage they are paid. Hence, wages depend on the economic success and the productivity of the firm. The profit maximizing firm pays a fair wage, which is above the equilibrium wage and induces involuntary unemployment. As the most productive firms start to export and the least productive firms leave the market after trade liberalization, average profits of firms and therefore wages rise. In this framework, trade liberalization increases involuntary unemployment. Egger et al. (2001) show that the international mobility of capital further exacerbates the negative effects of international trade on earnings

[47] The estimates indicate that trade with developing countries causes around 20% of the increase in European unemployment and approximately 10% of the rise in U.S. wage inequality.

dispersion or unemployment (in the presence of rigid labor markets).

Globalization and the elasticity of labor demand

Besides its impact on the relative wages or employment of unskilled workers, globalization may also increase the elasticity of the labor demand.[48] This can be a consequence of a greater ease at which domestic workers can be replaced by foreign labor due to imports or the relocation of the production.[49] A higher labor demand elasticity might adversely affect workers, for instance, by shifting the incidence of labor taxes from employers to workers or reducing the bargaining power of labor (Rodrik, 1997). Hence, international trade and capital mobility may also influence the functioning of the labor markets via their impact on labor demand elasticities. In particular, a greater integration into world markets tends to lower the relative strength of trade unions in the wage bargaining process. In product markets with imperfect competition, firms receive rents which are shared between firms and unions. International trade increases the competition in product markets and lowers firms' rents as well as the union wages (e.g. Gaston and Trefler, 1995). If unions do not realize this decline in rents and, hence, fail to adjust their wage claims, then unemployment will rise in response to the greater economic integration. Over time, unions adjust their bargaining behavior, which results in lower wages and unemployment (Blanchard and Philippon, 2003).

Choi (2001) analyzed how the threat effects of capital mobility influence the union wage premium. He argues that as the costs of foreign investment decline, the likelihood of offshoring production activities rises. The better outside options of the firms reduce the relative bargaining power of unions and therefore the union wage premium. A lower union wage premium might reduce unemployment. At the same time, the wage dispersion may increase if predominantly the wages of unskilled workers are bargained by unions.

Frictional unemployment

While labor market imperfections prevent a long-term adjustment of relative wages and therefore create unemployment, globalization may also increase job turnover and frictional unemployment. Trade models usually compare different long-term equilib-

[48] The analysis by Slaughter (2001) provides limited support for this hypothesis. International trade and capital mobility had the expected impact on labor demand elasticities in U.S. manufacturing between 1961 and 1991 but only if the empirical analysis does not include time effects.

[49] Relevant are not actual transactions but the ease at which they can be undertaken.

ria (e.g. the autarky versus free trade equilibrium) to elaborate on the distributive effects of exposure to international competition. The transition processes related to shifts in the production structure of trading economies are largely neglected (e.g. Richardson, 1995). Due to changes in the relative goods prices, the export sectors expand while import-competing sectors contract. If, as it is assumed by long-run trade models, workers are fully mobile between sectors, the relative wages adjust to reabsorb the displaced workers. These reallocations are, however, highly complex and relative prices will not adjust immediately. Consequently, workers who are displaced from import-competing industries will experience some period of search unemployment before finding a new job. The length of the transition period (and the average unemployment spell of displaced workers) and the size of the short-term adjustment costs depend on a country's institutional framework and its labor market flexibility. Davidson and Matusz (2000) emphasize the relevance of labor market institutions for the net gains from trade (i.e. the difference between long-term increases in income and short-term costs due to job loss). The authors propose a model incorporating workers with different abilities who experience consecutive periods of training, employment and unemployment. Trade liberalization leads to a reallocation of jobs from the low-tech to the high-tech sector and increases unemployment as workers in the high-tech sector require a specific training. Although the long-term benefits always exceed the short-term adjustment costs, their relative size depends on labor market institutions.[50]

The point discussed above is also raised by Ranjan (2012) who employs a short- to medium-run framework where labor is not mobile between the export and the import-competing sector. Trade liberalization increases both the creation and destruction of jobs in the import-competing industry, but has no immediate effect on job turnover in the export sector. Since the speed of transition differs between both sectors the unemployment rate adjusts gradually: while the jobs in the import-competing sector are destroyed immediately, new jobs are created in the export sector only in the medium run. Hence, trade liberalization will induce short-term spikes in unemployment. More generous unemployment benefits (as a reservation wage for workers) raise the job destruction and unemployment due to trade liberalization.

Felbermayr et al. (2011a) focus on the existence of labor market frictions, which prevent displaced workers from immediately finding a new employment because they

[50] Simulations by Davidson and Matusz indicate that the net gains from trade are highest if labor markets are either fully flexible or very rigid. Economies where the speed of adjustment lies between these extremes, the benefits might be almost offset by the short-term costs.

have to invest in a period of active search. Falling trade costs (or the emergence of new trading partners) raise the average productivity of firms (through a reallocation in market shares as in Melitz, 2003) and reduce search unemployment since the recruitment of workers becomes more profitable. In particular, rising productivity increases the value of the marginal product of labor relative to the recruitment costs of firms.[51] Thus, declining trade costs can both lower unemployment and raise real wages as long as it improves average productivity.

Hypothesis 3 *Globalization is expected to increase the unemployment of unskilled workers if the relative wages of unskilled workers do not fully adjust to demand shifts (e.g. in the presence of labor market rigidities). In particular in the short-run, international trade and capital mobility may lead to a rise in transitory unemployment. In the medium- to long-run, globalization could also lower unemployment, for instance, by raising labor productivity or reducing labor market frictions.*

Empirical tests of the relationship between openness and unemployment in advanced economies are still scarce. Trefler (2004) studies the consequences of the free-trade agreement between Canada and the U.S. (NAFTA) for Canadian industries. His findings suggest that tariff cuts induced considerable job losses especially in import-competing industries. These negative consequences of trade liberalization, however, seem to reflect the short-run adjustment costs as Canada did not experience a permanent increase in unemployment.[52] Hence, while trade liberalization tends to increase frictional unemployment due to the reallocation of resources between industries and firms, the long-run effects are less obvious. Felbermayr et al. (2011b) find that trade openness tends to lower unemployment for a panel of 20 OECD countries.[53] The analysis conducted by Checci and Garcia-Penalosa (2010) also points at a negative relationship between openness and unemployment.

The long-run consequences of international trade and capital mobility for the development of unemployment rates likely depend on the impact of globalization

[51] The firms' decision to post vacancies and hire workers is based on a comparison of the shadow value (i.e. the additional revenue generated) of an additional worker relative to the expected marginal recruitment costs. Once a firm and worker are matched, they bargain over the wage including the rents generated by the successful job match. Falling trade costs raises the average productivity of firms and thus also the rents. As long as firms receive some of the rents resulting from a filled vacancy, they will hire more workers. Hence, search unemployment will decline.

[52] Trefler's analysis points at the same time at considerable productivity gains and therefore long-term benefits of NAFTA for the Canadian economy.

[53] The regressions show either significant negative or insignificant effects of trade openness on unemployment.

on labor market institutions. A rich empirical literature analyzes to what extent various labor market institutions are responsible for the evolution of unemployment in OECD countries. The evidence regarding the quantitative impact of labor market institutions for unemployment patterns in industrialized countries since the 1960s is mixed. Several studies indicate that labor market institutions such as the bargaining power of trade unions, employment protection or employment taxes explain a considerable part of the unemployment trends (e.g. DiNardo et al., 1996; Nickell et al., 2005; Checci and Garcia-Penalosa, 2010). Di Tella and MacCulloch (2005) present some evidence, too, that inflexible labor market institutions are positively correlated with unemployment rates and the persistence of unemployment (i.e. the share of long-term unemployed). Bassanini and Duval (2009) further stress the relevance of systematic interactions between different institutions. Using a sample of 20 OECD countries, the empirical findings indicate substantial reform complementarities. In particular, liberal reforms of labor market institutions have a greater employment effect in more market-friendly environments. The common perception that labor market institutions, especially the generosity of benefit replacement rates for the unemployed, are a main driver of high and persistent unemployment rates is questioned by Howell and Rehm (2009). The authors argue that since workers have a distaste for unemployment, changes in unemployment generosity do not have a considerable impact on overall unemployment. Indeed, they do not find a significant correlation between benefit generosity and unemployment rates.

As described above, several theoretical works predict that globalization might induce labor market deregulation. Empirical evidence on the impact of globalization on labor market institutions is scarce. In a recent attempt of analyzing this relationship, Potrafke (2013) does not find significant correlations between globalization and the strictness of labor market regulations.

5.1.3 Supply of human capital and capital formation

The possibility of adjustments in the relative supply of skilled workers or capital has been neglected in the preceding discussion. Standard models usually assume that the factor endowments are fixed. Then, labor, human capital and capital are supplied inelastically and the possibility of education or capital formation is ignored. Both international trade and capital mobility are expected to raise the real interest rate and the skill premium in industrialized countries (and lowers thus the relative wage of unskilled workers or worsens their employment opportunities). The greater returns to investment in capital (i.e. saving) or in education (human capital

formation) should in the medium- to long-run increase the supply of capital and of skilled workers.

The subsequent section provides a brief overview about the expected impact of globalization on the relative factor supplies and the dynamics of the adjustment process.

The theory on capital formation has been pioneered by Ramsey (1928). The decision about current consumption and savings is based on the interaction between inter-temporal preferences (i.e. preferences for current versus future consumption) and real interest rates.[54] A rise in the interest rates reduces, ceteris paribus, the attractiveness of current in relation to future consumption and individuals will save more as interest rates rise. In industrialized economies, globalization should then increase the incentives to accumulate capital.

Moreover, the shift in relative demand for skilled labor induced by globalization should also affect the relative supply of human capital. The subsequent discussion of the supply and demand framework is based on Johnson (1997) and Atkinson (2008).[55] Figure 5.3 illustrates how the rise in the relative demand for skilled workers changes the relative wages for skilled (S) and unskilled (U) workers ($\frac{w_S}{w_U}$).

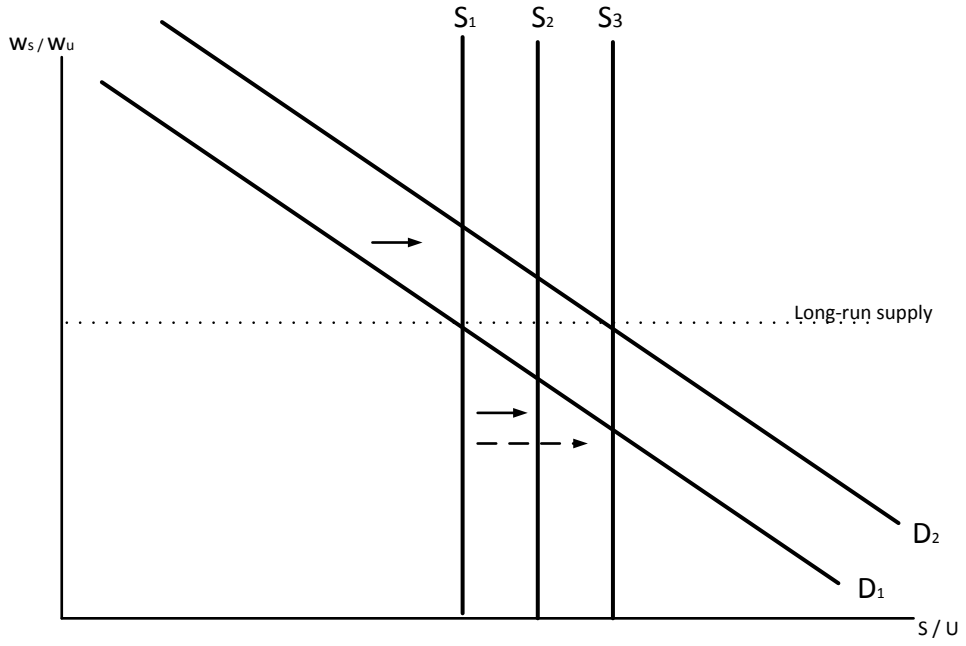
In the short run, the relative supply of skilled workers is fixed (as indicated by the vertical supply curve). Hence, a sudden shift of the demand curve (from D_1 to D_2) induces a rise in the relative wage of skilled workers.[56] Classical theories of human capital formation (e.g. proposed by Becker, 1962) suggest that an individual's decision to invest in education is based on a maximization of the present value of his expected lifetime earnings. Globalization induces a shift in the relative demand for educated workers and therefore increases their relative wage. Since the returns to an investment in human capital increase, it becomes more attractive to acquire skills. Thus, the relative supply of skilled labor is expected to rise which is indicated by the outward shift of the short-run relative supply curve in Figure 5.3. This again leads to a decline in the wage premium. If the increase in relative demand dominates the change in relative supply of skilled labor (i.e. for a shift of the short-run relative supply curve from S_1 to S_2), the relative wage remains at a level above the long-run equilibrium. If the supply of human capital rises proportional to the relative demand for educated workers (i.e. shift of the short-run relative supply

[54] Rising interest rates should (with unchanged preferences) induce a shift of consumption into the future if the substitution effect exceeds the income effect.

[55] Goldin and Katz (2007a,b) conclude that such a demand and supply framework can explain much of the long-run trends in the U.S. skill premium.

[56] The extent to which the skill premium increases depends on the elasticity of substitution between skilled and unskilled labor (i.e. the slope of the relative demand curve).

Figure 5.3: Determination of relative wages based on a demand and supply framework



Notes: Based on Atkinson (2008), page 8.

from S_1 to S_3), the relative wage will return to its long-run equilibrium level.

The long-run supply of educated workers and the relative wage (i.e. the horizontal line in Figure 5.3) is based on human capital formation models assuming that all individuals are identical in their capabilities and decide on investment in education by comparing the present value of their earnings. In the absence of any schooling costs, the opportunity costs of training are equal to the postponement of earnings. In this framework, the wage differential equals the opportunity costs of education and is just sufficient to compensate for the foregone discounted earnings.[57]

The dynamics of shifts in relative skill demand and supply which continue over time have been described by Atkinson (2008). The basic idea that the increasing exposure to globalization (or to skill-biased technological change) is responsible for the rising skill premium in industrialized countries implies permanent shifts in the relative demand for educated workers. If the relative demand curve steadily shifts

[57] The size of the wage differential depends on the real interest rate since the foregone earnings during the training period have to be discounted to calculate their present value. A higher real interest rate then increases the present value of the foregone earnings and hence the opportunity costs of education. Thus, higher interest rates lead to a greater wage differential. Capital markets may also explain the rise of the skill premium (compare Atkinson, 2008).

upward at a constant proportional rate, then the skill premium increases. This leads to a rise in the relative skill supply. The steady increase of the relative demand results in a semi-equilibrium where skilled labor persistently receives a skill premium exceeding the long-run equilibrium. Even if this wage differential remains constant (despite a steady increase in the relative demand for skilled workers), the share of unskilled workers will fall.

Tinbergen (1974) named the persistent shifts in both the relative demand for and supply of educated workers the "race between technology and education".[58] The evolution of the skill premium depends on the relative strength of demand and supply adjustments.

Cross-country differences in the speed of supply changes may explain different developments of the earnings distribution although all countries face comparable changes in the relative demand for skilled labor induced by globalization or technological change. Furthermore, the ability to react to adjustments in the relative returns to education depends on a country's institutional framework (such as its education system and labor market institutions).

The expectations regarding the effect of globalization on the human capital supply is summarized in hypothesis 4.

Hypothesis 4 *Globalization, and the resulting increase in the relative demand for skilled labor, should lower the relative supply of unskilled workers as it raises the returns to education in the industrialized countries.*

The determinants of human capital formation and the relative endowment of skilled workers have been studied theoretically and also related to a country's exposure to globalization. Still, the relationship between international economic integration and investment in human capital has been widely neglected in the empirical literature, which focuses mostly on other labor market outcomes such as the evolution of the wage differential.[59]

Machin and Van Reenen (1998) elaborate on the impact of technological change on the supply of skills in seven OECD countries between 1973 to 1989. The authors focus on technological change as an explanation for changes in the relative demand

[58] The development of the skill premium ultimately depends on the relative pace of both changes. Goldin and Katz (2007a,b) further study this race focusing on the United States (see also the review by Acemoglu and Autor (2012) and their extension using the task approach).

[59] A notable exception is a recent study by Hickman and Olney (2011) who analyze how offshoring and immigration affect the education decision of U.S. workers. The findings point at some impact of globalization on investments in human capital as the enrollment rates in community colleges are higher in states with a higher share of immigrants and workers employed in foreign-owned firms.

for skilled labor. The empirical analysis of industry-level data reveals a positive (and mostly significant) association between the R&D intensity and the compensation of non-production relative to production workers. Import penetration does, however, not contribute significantly to the explanation of changes in the wage-bill shares of non-production workers.

5.2 The distribution of production factors within the population

The preceding section discussed the potential effects of globalization on the functional income distribution. Statements about the impact of international trade and capital mobility on the distribution of market incomes, however, require a profound knowledge about how production factors are distributed within the population of a country.

The question whether the inequality of market incomes increases in response to a greater economic integration or not can only be answered empirically. Due to its focus on the role of transmission mechanisms, the empirical analysis in section 7.2 shall provide information on how changes in the functional income distribution affect market inequality. Nevertheless, this section already offers a first insight into the distribution of production factors within the population of OECD countries based on a descriptive analysis and the findings by some recent studies.

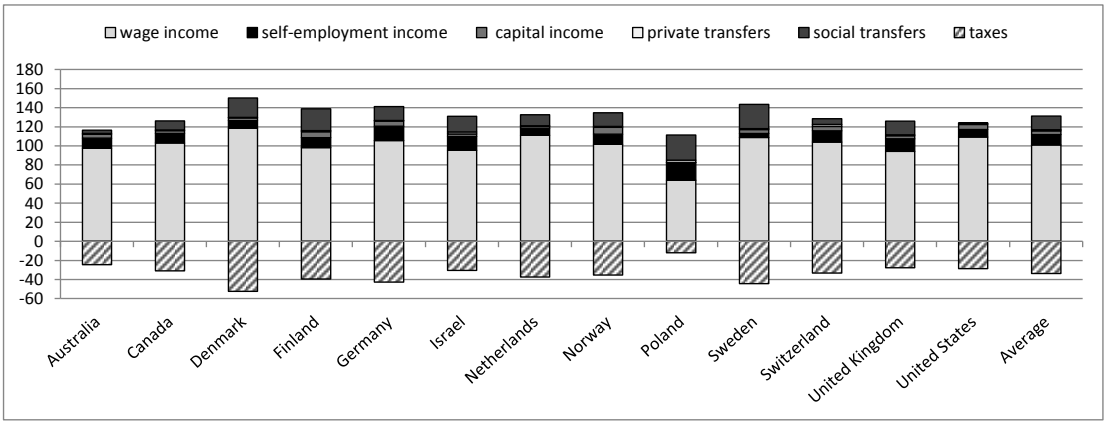
In general, individuals receive incomes from different sources (e.g. employment, self-employment or capital) and might therefore at the same time be affected by different developments of the functional income distribution. Beyond the distribution of production factors between individuals, also the household composition (e.g. assortative mating and household size) matters if the relevant income unit is the household.[60]

Figure 5.4 provides information about the relative importance of different income sources for the population in eleven OECD countries around the year 2000. Moreover, differences in the relevance of these income sources for the disposable income of low and high income individuals are compared across the respective countries.

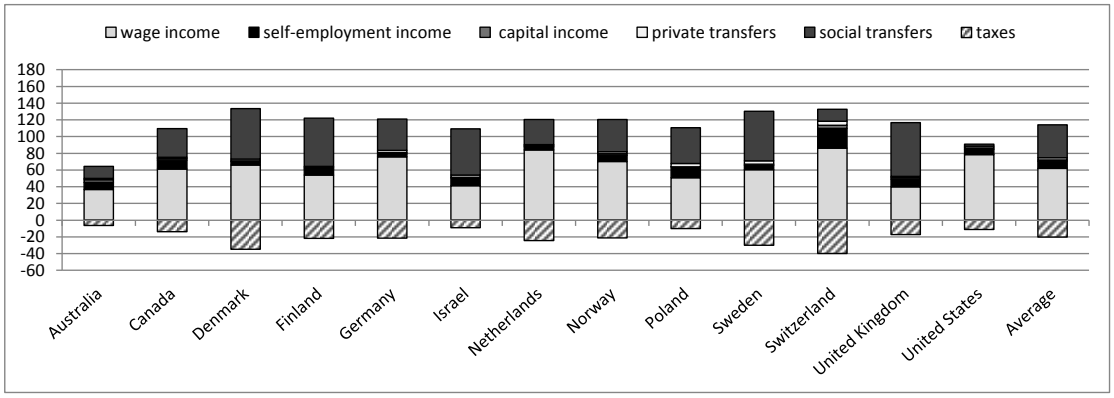
Although this section focuses on the distribution of market incomes, non-market

[60] Changes in living arrangements (e.g. rise in the importance of single-households) and demographic structures (e.g. increasing share of the elderly) affect the income distribution. Since this study focuses on economic factors, I do not address these factors explicitly but have tested in the subsequent econometric analysis whether compositional effects matter for the explanation of income differences. For a detailed discussion see OECD (2008, 2011).

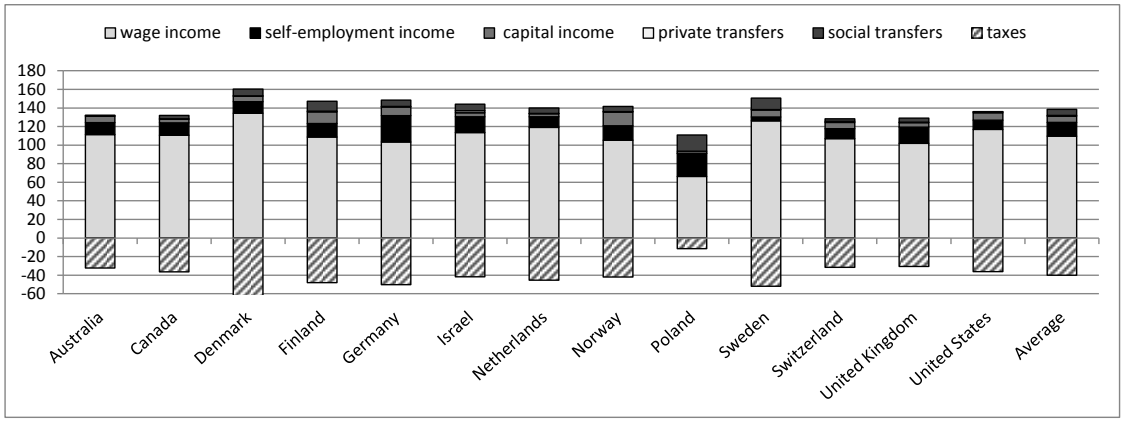
Figure 5.4: Share of different income sources in total income



(a) all income groups



(b) low income recipients



(c) high income recipients

Notes: Own calculations based on equivalent incomes. Data comes from the wave V (around 2000) of the Luxembourg Income Study. More information about the data concept is offered in chapter 6.2 and information about the exact years to which the data refers is available in Table A.2.

income components (e.g. private and public transfers, social security contributions and direct taxes) should also be relevant since taxes and transfers affect individual incentives to work or invest and thereby indirectly also the market incomes.

Figure 5.4 (a) depicts the shares of wage, self-employment and capital income, private and social transfers as well as income tax payments and social security contributions in the average disposable income for the population of eleven OECD countries in 2000. It is evident that incomes from dependent work are the most important income source in these countries. The average for the examined countries suggests that wages account for 101 percent of the total income (i.e. before the deduction of taxes and social security contributions).[61] However, the contributions of wage incomes differ between the countries: gross wage incomes make up only 64 percent of the disposable income of the average person in Poland but almost 119 percent in Denmark. These differences are related to both a higher tax burden in Denmark and the relative importance of other income sources for individuals in Poland. Incomes from self-employment activity contribute on average to 11 percent of the disposable income in these industrialized countries. The data indicates a substantial variation in the importance of this income source between these countries: the relative importance of self-employment for the average disposable income of the population is lowest in Sweden (4 percent) and highest in Poland (18 percent). Capital income is a less relevant income source for the population average: The average share of gross capital incomes in disposable incomes for the eleven OECD countries is 4 percent and varies between 0.2 percent in Poland and 7.3 percent in Norway.

The relative weight of different income sources for the average income earners already reveals that the overall importance of different income sources varies considerably. Consequently, an equal increase in the dispersion of the wage or capital income distribution might have very different implications for the development of market inequality.[62] Furthermore, one needs to examine differences in the relevance of these income sources for different types of income recipients. The overall distributive consequences of an increase in the rewards to capital relative to labor for market income inequality depends on the relative importance of these income sources for

[61] The share of all single income sources may add to more than 100 percent of the disposable income because the income sources are all gross of taxes. To normalize the contribution of the different incomes, one could deduct the average taxes (share of taxes and social security payments) from each income source. This might, however, not be useful here as the main interest is on information about market incomes.

[62] In general, contribution of a single type of income to overall income inequality depends both on how unequal this income type is distributed within the population and on how much the particular income type contributes to the overall income.

low and high income households. If high income earners receive a greater share of their incomes from capital than low income recipients, then higher relative payments to capital should raise the inequality of market incomes and vice versa.

Hence, Figure 5.4 (b) and (c) present the shares of different income sources in disposable incomes both for low and high income individuals. A first overall finding is that the different types of market-generated incomes contribute less to the average disposable income of the 25 percent of the population with the lowest equivalent incomes than of the 25 percent with the highest incomes. The average of all examined countries suggest that nearly 42 percent of the disposable income of individuals belonging to the lowest quartile consists of transfer income. In contrast to that, the share of transfers in the disposable income of the upper quartile is on average about 7 percent. The relative importance of each type of market income also confirms this general finding: the share of wage and self-employment income in disposable income of a high income individual is on average about 1.7 times higher than for an individual in the lowest quartile of the income distribution. The difference between high and low income individuals is even more pronounced for capital incomes. In this case, the share of capital incomes in disposable income is on average four times higher for high than for low income recipients. This suggests that wealthy individuals earn disproportionately more capital income than low income individuals and, hence, also benefit from a rise in rewards to capital relative to labor. As a consequence, market income inequality is expected to rise.

To achieve a broader impression of the relationship between the functional and personal income distribution, the descriptive analysis presented above is supplemented by two recent OECD studies (OECD, 2008, 2011) that describe the relationship between factor and market income inequality. The main findings suggest that the more unequal distribution of wages (among full-time employed men)[63] has contributed to a more dispersed market income distribution in the OECD. Besides changes in wage inequality, work intensity also matters for the evolution of market income inequality. During the last decades, reductions of hours for workers (e.g. the growing incidence of part-time and temporary work) have raised the dispersion of market incomes as foremost low-wage recipients work fewer hours. The distribution of household wages, which is affected by partnership formation and household size (i.e. via economies of scale in consumption), has remained rather stable since the mid-1990s. This is mainly because increasing labor market participation has

[63] The studies use data from the OECD earnings data set which offers information on weekly, monthly and annual wages of full-time employees (here: dependent male workers) at various percentiles.

offset the effect of growing wage dispersion on the distribution of wages between households. In addition, the relevance of non-wage incomes for the market income distribution is rather modest. Despite the more uneven distribution of incomes from capital and self-employment compared to wage incomes and the fact that the increase in their inequality was greater in most OECD countries, these non-wage incomes account only for a small share of the overall income.

This general pattern is also supported by the findings of Kenworthy (2008), which suggest a strong positive relationship between market income inequality and the dispersion of earnings among employed workers, the share of households without earners and - though less pronounced - the share of single-adult households and the correlation between spouses' earnings.[64] His bivariate correlations based on twelve advanced economies do, however, not support the findings of the OECD regarding a strong impact of (part-time) employment on the distribution of market incomes.

5.3 Redistribution of incomes through the tax and transfer system

The distribution of disposable incomes and therefore of consumption possibilities depends not only on the distribution of market incomes among individuals but also on the design and implementation of redistributive policies (e.g. taxes and transfers). Beyond its impact on the distribution of market incomes, globalization might also change the effectiveness and scope of redistributive policies.

The consequences of a greater integration of a country into world goods and capital markets for its government size and structure are theoretically ambiguous. In principle, two distinct impacts of globalization should be taken into account: on the one hand, the competition for mobile factors might increase the costs of redistribution for national governments. On the other hand, globalization likely raises market income inequality (as discussed in the preceding sections) and potentially also income volatility (via a greater exposure to external income risks), which leads to a higher demand for redistribution among voters.

The first effect (the so-called *"efficiency hypothesis"*) relates to the supply of public redistribution and suggests that the openness to international trade and capital mobility limits the size of the welfare state. The second effect (the *"compensation*

[64] From the perspective of social policy, differences between market and disposable incomes are of major interest. Nonetheless, a detailed knowledge of the sources of income differences may be required to design policies targeted at a potentially desired reduction of inequality.

hypothesis") takes a demand-side view and expects rising redistribution and social security spending as voters' support for globalization policies might be conditional to an adequate compensation.

The basic ideas behind these opposite effects of globalization are briefly summarized below. For an extensive survey, which focuses also on supply and demand side explanations compare, for instance, Schulze and Ursprung (1999).

The efficiency hypothesis rests on the basic reasoning that the competition of national states for mobile production factors (mostly capital) constrains the scope of taxation. The classical model of tax competition[65] by Zodrow and Mieszkowski (1986) predicts that the mobility of capital between different jurisdictions lowers the provision of public goods due to the inefficiency of capital taxation in a small open economy. From the perspective of a small open economy, the net returns to capital (or other mobile factors) are determined on the world market. Hence, the government's scope to raise a capital tax is limited since fully mobile capital will leave if the returns net of taxes fall below those available at the world market. Countries that impose higher capital tax rates than other jurisdictions will experience capital outflows and an erosion of the tax base, which impedes the provision of public goods and transfers.[66] Most of the early works on the consequences of capital tax competition conclude that the competition for mobile capital leads to lower taxes on capital and levels of public goods (an extensive survey is provided by Wilson and Wildasin, 2004; Fuest et al., 2005).

There are though reasons to expect that tax competition does not fully abolish a government's possibility to tax mobile factors. In principle, taxation is but one aspect in the location decision of firms and mobile capital. If taxes are used to finance the provision of public input goods (e.g. infrastructure, education), which increase the productivity of capital and thereby its gross returns, then taxation should still be possible. Nevertheless, capital would then only pay for the use of services and does not engage in redistribution.

The distributive effects of tax competition for mobile factors are also evident

---

65 Wilson and Wildasin (2004) propose to define tax competition "as [a] noncooperative tax setting by independent governments, under which each government's policy choices influence the allocation of a mobile tax base [e.g. workers, firms, capital, or shoppers] among 'regions' represented by these governments" (p. 1067).

66 The assessment of the decline of tax rates due to tax competition depends on the question whether the autarky tax level has been chosen to maximize welfare or not. In the first case, tax competition may lead to inefficiently low taxes and an underprovision of public goods. If the size of the government is, however, excessively high and does not maximize voters utility (e.g. as suggested by Leviathan models described e.g. in Blankart, 2008, chapter 11.C), then the constraints due to capital mobility are welfare-enhancing.

if at least one production factor is not fully mobile between different countries. If capital is fully mobile and labor cannot cross borders, then capital could escape redistributive taxation and the reduction of the domestic capital stock would lower the productivity and the income of labor as the complementary factor of production. The tax burden is thus shifted to labor as the immobile and inelastically supplied factor. Based on optimal taxation theory, capital, whose supply is infinitely elastic from the perspective of a small open economy, should not be taxed.

In several cases, capital taxation is still possible (Wilson and Wildasin, 2004). For instance, large countries that can influence the net returns to capital on the world market will be able to tax capital (though presumingly less than under autarky). Moreover, international mobility of production factors can also lead to lower subsidies on mobile firms by limiting the opportunities of wasteful policies (such as strategic trade policies, compare Janeba, 1998).

In addition, trade liberalization does also not necessarily impede the possibility of income redistribution between different sectors. Vannoorenberghe and Janeba (2013) propose a model with workers who differ in their sector-specific productivity and are partly mobile between different sectors. The workers decide by majority voting over redistribution toward the sector facing a low demand. If redistribution is implemented its extent will be higher under free trade than under autarky (as redistribution is more likely in an open economy though with lower amounts).[67]

Due to an apparent fear of a "race to the bottom" in taxation and welfare state spending (as predicted, for instance, by Sinn, 2003), politicians regularly attempt to limit the extent of international tax competition through political coordination.[68] Boockmann and Vaubel (2009) stress that international coordination may not simply prevent a (potentially harmful) decline in taxation but rather result in a minimum level of taxation, which is even higher than the level originally chosen by high-tax countries. Under majority voting, high-tax countries try to raise their rivals' costs and increase taxes in other countries. Hence, the high-tax majority aims at establishing its (or an even higher) level of taxation also in other countries which prefer lower taxes. Moreover, the authors stress that even if governments compete for mobile capital and are also interested in taxation (e.g. to win elections) this would induce a "race to the Nash-point" (i.e. an uncooperative equilibrium with a

[67] The basic idea behind this result is that in a small open economy, subsidization of a sector is less distortive and more redistributive than in a closed economy because the subsidy does not affect goods prices and demand on the world market.

[68] Such as the Code of Conduct for business taxation of the European Union (compare `http://ec.europa.eu/taxation_customs/taxation/company_tax/harmful_tax_practices/`).

positive level of taxation and regulation) rather than a "race to the bottom".

In the following, I review some theories that predict a positive relationship between a greater exposure to global markets and the size of the welfare state.

A political-economic explanation for rising redistribution is based on the median voter theorem, which explains political outcomes with majority decisions. Given that several assumptions regarding the preferences of voters and political parties apply,[69] the policy choice of the median voter will be implemented. Meltzer and Richard (1981) employ the median voter approach to explain political decisions about income redistribution. The redistributive policy consists of a lump-sum transfer financed by a proportional income tax. The median voter chooses the tax rate, which maximizes his utility considering that the tax distorts individual work incentives and therefore reduces the overall income. The choice of the tax rate depends on the difference between the median and mean income. If the median income is below the mean income, then the median voter benefits financially from income redistribution and vice versa.

Since the inequality of before tax-and-transfer incomes likely increases as an industrialized country opens to international trade and capital mobility (see section 5.1), the difference between the median and mean income rises (and the distribution will be more skewed to the right). The median voter, hence, is more likely to gain more from redistribution and votes for higher tax rates. Consequently, a greater international integration should raise the extent of redistribution through its effect on market income inequality.

A further explanation for a positive effect of globalization on the size of the welfare state is based on an insurance motive. Rodrik (1998) explains the observation that more open countries tend to have bigger governments based on the risk-mitigating role of public spending notably unemployment insurance and transfers to the unemployed. The basic argument is that globalization increases a country's exposure to external risk and thus income volatility.[70] Wildasin (1995) objects that with region-specific shocks interregional mobility of workers and a public insurance against income shocks (at the national level) are substitutes.[71] To the extent that

[69] These assumptions are the single-peakedness of voters' preferences regarding a one-dimensional policy decision, the competition between two political parties aiming to maximize votes and everyone being fully informed.

[70] From a theoretical perspective, globalization does not necessarily imply greater risks at national level. A small open economy may experience lower price volatility on world markets and also the opportunity of diversification might reduce risks (e.g. on capital markets).

[71] Wildasin focuses on a jurisdiction where the regions might be hit by region-specific shocks that reduce the income of workers. If workers are fully mobile between regions, then those who experience a negative income shock will move to a high income jurisdiction and thus wages

full arbitrage of factor returns is not possible (e.g. due to a home bias in investment) or not all factors are fully mobile, voters may still demand public expenditures as an insurance for income risks. Government spending e.g. on welfare and social insurance programs reduces income risk.[72] As a country's exposure to external risks (e.g. volatility of the terms-of-trade) rises with greater openness, its risk-averse voters will demand more public expenditures. This reasoning is also supported empirically by Rodrik who shows that the positive effect of trade openness on government expenditures (and for industrialized countries also social spending) is mainly present for countries facing a high terms-of-trade risk. This finding suggests that a country's integration into world markets may be accompanied by higher social spending and welfare state expenditures since voters demand a compensation for their greater risks.

Another explanation for increasing social spending in OECD countries is provided by Vaubel (2005). Several empirical studies indicate that the rise in social expenditures as a percentage of GDP is closely related with increasing unemployment rates. Vaubel argues that capital exports have contributed to rising unemployment in OECD countries to the extent that wages did not adjust to lower labor productivity. Higher unemployment has, then, induced a rise in social insurance expenditures. The positive relationship between the exposure to globalization and welfare state size is, hence, not driven by changes in the demand for redistribution but reflect the inability of countries to adjust to changes in labor productivity.

For the effect of globalization on the scope of redistribution no clear hypothesis exists.

Hypothesis 5 *The overall impact of globalization on income redistribution is ambiguous.*

(a) *A negative relationship between globalization and income redistribution is predicted by the efficiency hypothesis since governments face rising costs of financing redistributive policies.*

(b) *A positive relationship between globalization and income redistribution is expected by the compensation hypothesis. In this case the demand for redistribution*

will equalize between regions. Insofar, interregional labor mobility functions as an insurance against income shocks.

[72] Rodrik (1998) considers a more general case, which focuses on general government spending. His basic argument is that incomes and employment in the government sector are more stable than those in the private sector and thus a larger government share reduces income risks. The risk-mitigating effects are, however, supposed to be highest for social insurance and welfare state spending. This does not fully apply for developing countries without a functioning welfare system but for advanced economies.

increases because

1. *the median voter will demand more income redistribution because his income will fall relative to the average income if globalization leads to greater market income inequality.*

2. *voters demand higher welfare state spending and redistribution as an insurance against greater external income and employment risks. In this case, in particular the compensation for unemployed individuals should rise as a country's economic integration increases.*

3. *the unemployment rate increases if the wages do not adjust to falling labor productivity in countries that experience capital exports.*

The empirical evidence on the relationship between globalization and government expenditures, welfare state size or income redistribution delivers rather mixed results (for a survey, see e.g. Schulze and Ursprung, 1999; Dreher et al., 2008). This might reflect the opposing effects on the governments' costs of financing the welfare state and redistribution on the one hand and the increasing demand for those policies by voters on the other hand. Several authors do not find any empirical support for the argument that globalization reduces taxes on mobile factors and welfare state spending. Vaubel (2000) provides empirical evidence indicating that rising imports significantly increase social spending as a percentage of GDP.

To disentangle the effects of international trade and factor mobility on fiscal policies, both its influence on a governments' costs of raising revenue and on the size and composition of expenditures matters. A comprehensive analysis including both aspects has been conducted by Dreher (2006). His empirical analysis based on a sample of OECD countries between 1970 and 2000 even points at a positive relationship between globalization and revenues from capital taxation. In addition, Dreher et al. (2008) do not find evidence that globalization affects the composition of government expenditures. The absence of a significant impact of economic integration may also be interpreted as evidence against the compensation hypothesis since especially public expenditures with an insurance character (e.g. unemployment compensation) should be raised.[73]

A further channel through which globalization might influence income redistribution is related to its consequences for the distribution of market incomes. A large literature has been devoted to the study of the relationship between market income inequality and redistributive spending (for a survey, see Mohl and Pamp, 2008).

[73] Burgoon (2001) provides some evidence in favor of this hypothesis since trade with low-wage countries is positively associated with expenditures on labor training and relocation policies.

A prominent theory of fiscal redistribution, the median voter theorem, indicates a positive relationship between income inequality and redistribution (Meltzer and Richard, 1981).[74] The effect of greater income inequality and thus the difference between the median and mean income has been studied by several empirical studies. Kenworthy and Pontusson (2005) find a positive correlation between market income inequality and redistribution (measured as the extent to which market-induced income differences are reduced by the tax and transfer system). The distribution of market incomes has become more unequal in the 1980s and 1990s[75] but due to redistribution the inequality of disposable incomes increased less (see chapter 3). A further test of the median voter hypothesis is provided by Milanovic (2000). He also finds that countries with greater market income inequality redistribute more to the poor, at least if pension incomes are included.[76] The validity of the median voter theorem (e.g. a redistribution from rich to poor as inequality rises) vis-à-vis alternative theories predicting less redistributive spending and thus benefit the rich (e.g. Moene and Wallerstein, 2001, 2003, since the median voter's demand for insurance decreases with falling income) or redistribution from both ends to the middle of the distribution (e.g. through the public provision of goods) has been analyzed by Mohl and Pamp (2008). The authors find that redistribution is higher if market incomes are more unequally distributed and these results seem to be driven mostly by income differences between the middle and the top of the distribution. Hence, the findings support the median voter hypothesis.[77] But the middle class seems to benefit not only from redistribution from the top but also from the bottom of the distribution as the bottom quintile loses from redistribution.

[74] Moene and Wallerstein (2001, 2003) argue that greater inequality could also be negatively related with government spending, in particular, if they have a strong insurance character.

[75] The authors argue that rising market inequality during this period has been mainly driven by employment changes.

[76] Milanovic (2000) also analyzes whether different income deciles gain from redistribution. The fifth decile does not gain and thus the median voter hypothesis is not supported in a narrow sense.

[77] As a straightforward test of the median voter theorem, the authors also relate the difference between the mean and median income to redistribution but do not find a significant relationship.

Chapter 6

Empirical strategy and data

This chapter explains the data and empirical strategy employed to estimate the relative importance of the transmission mechanisms through which globalization affects the personal income distribution.

6.1 Empirical strategy

The basic empirical approach is to decompose the analysis into two parts: the first part of the analysis measures how globalization influences the various transmission mechanisms related to the functional distribution of incomes and the scope of the welfare state. In the second part, I relate these transmission mechanisms to the distribution of market and disposable incomes as well as to the extent of income redistribution. The aim of this approach is to provide a comprehensive test of the effects of globalization on a set of labor market outcomes and how these translate into a greater (or smaller) income inequality. Moreover, the estimated coefficients are used to infer on the relative importance of each transmission mechanism.

Based on the theoretical considerations discussed in chapter 5 the analysis focuses on five transmission mechanisms.[78] The relative rewards of production factors are measured based on the labor income share and the wage dispersion (as a proxy for the relative wages of skilled versus unskilled workers). Furthermore, the unemployment rate captures employment responses to globalization. To proxy the relative supply of human capital, I use the ratio between individuals with tertiary and those with primary education for the population aged 25 years and older. Finally, the generosity of the welfare state is indicated by the disposable income of unemployed individuals relative to that of employees.

[78] Chapter 6.2 offers detailed information on the definition of the variables and the data sources.

In line with the basic idea of the estimation approach, the Figures 6.1 and 6.2 illustrate the correlation between globalization and these transmission mechanisms as well as between the latter and income inequality or redistribution. The scatterplots already provide first insights into the relationship between globalization and labor market outcomes.[79]

The first column of Figure 6.1 shows that openness toward international trade is negatively related with a country's share of income accruing to labor (*labor income share*).[80] Imports from non-OECD countries (as a percentage of total imports) are significantly related to all five transmission mechanisms (see column two): countries with a greater share of imports from less developed economies have also a lower relative income of labor and unemployed individuals (*relative income unemployed*), more dispersed wages, a higher unemployment rate and also a higher share of well educated individuals (*relative supply human capital*). The relationship between net exports of private capital and the examined labor market outcomes is presented in the third column of Figure 6.1. A significantly negative correlation exists between net exports of private capital (in percent of GDP) and the wage dispersion as well as the unemployment rate, whereas a significantly positive correlation is found between net exports of private capital and the relative supply of human capital.

Figure 6.2 shows how the transmission mechanisms are related to the income distribution and redistribution. The simple correlations suggest that the market inequality tends to be higher in countries with a lower labor income share, more dispersed wages, higher unemployment rates, higher shares of well educated workers and a lower relative income of unemployed individuals. Moreover, the extent to which market-induced income differences are reduced through taxes and transfers is negatively correlated with the wage differential and the relative supply of human capital. In contrast to this, a higher unemployment rate is positively related with the percentage of market income inequality that is reduced via redistribution.

[79] In general, the scatterplots do not indicate causal relationships but probably only spurious correlations (e.g. originating from common trends in variables).

[80] Discussed are only bivariate correlations that are significant at least at the 10%-level.

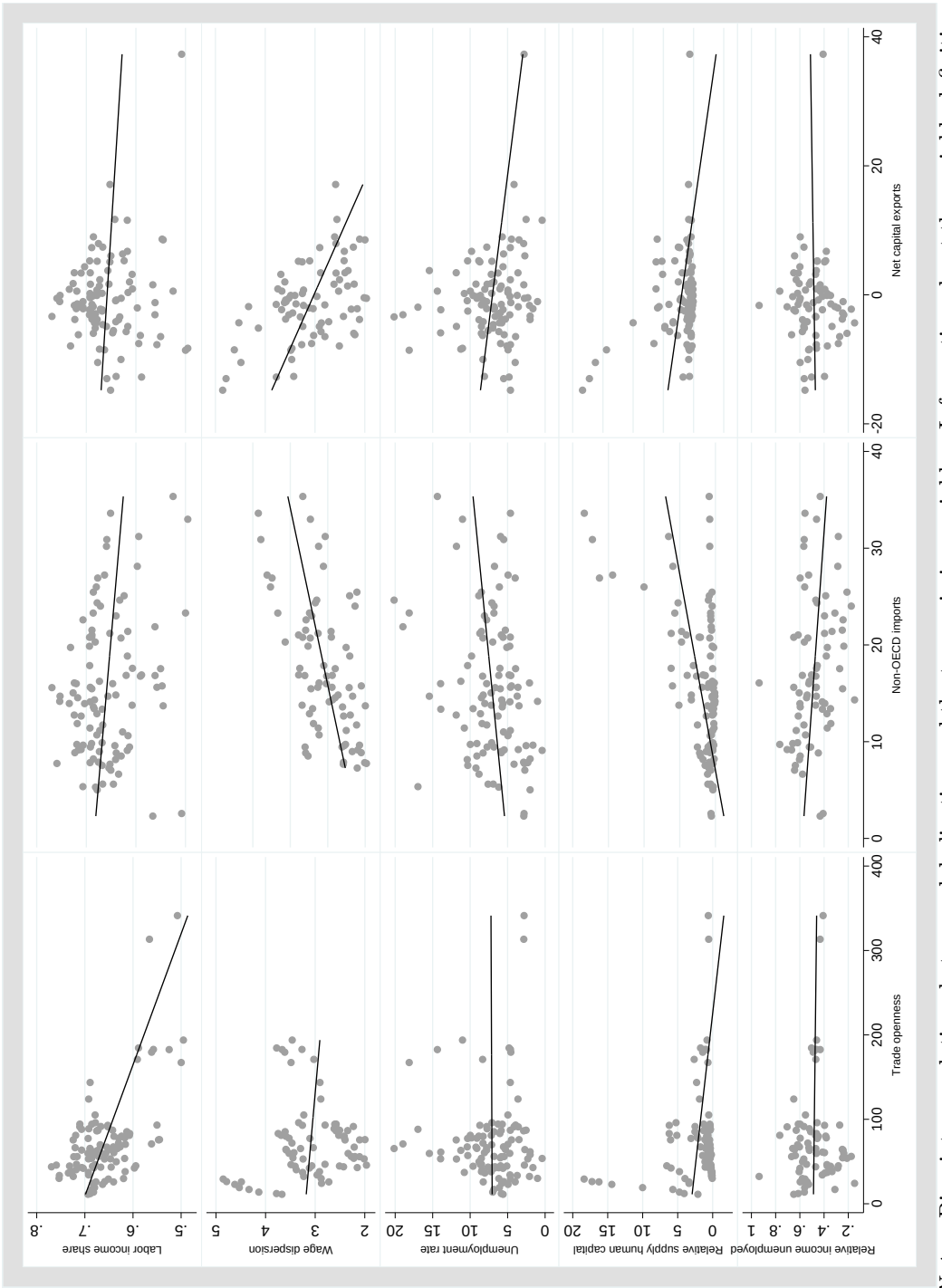


Figure 6.1: Relationship between globalization and the transmission mechanisms

Notes: Bivariate correlations between globalization and the transmission variables. Information about the variable definitions and data sources is provided in chapter 6.2 and Table A.1.

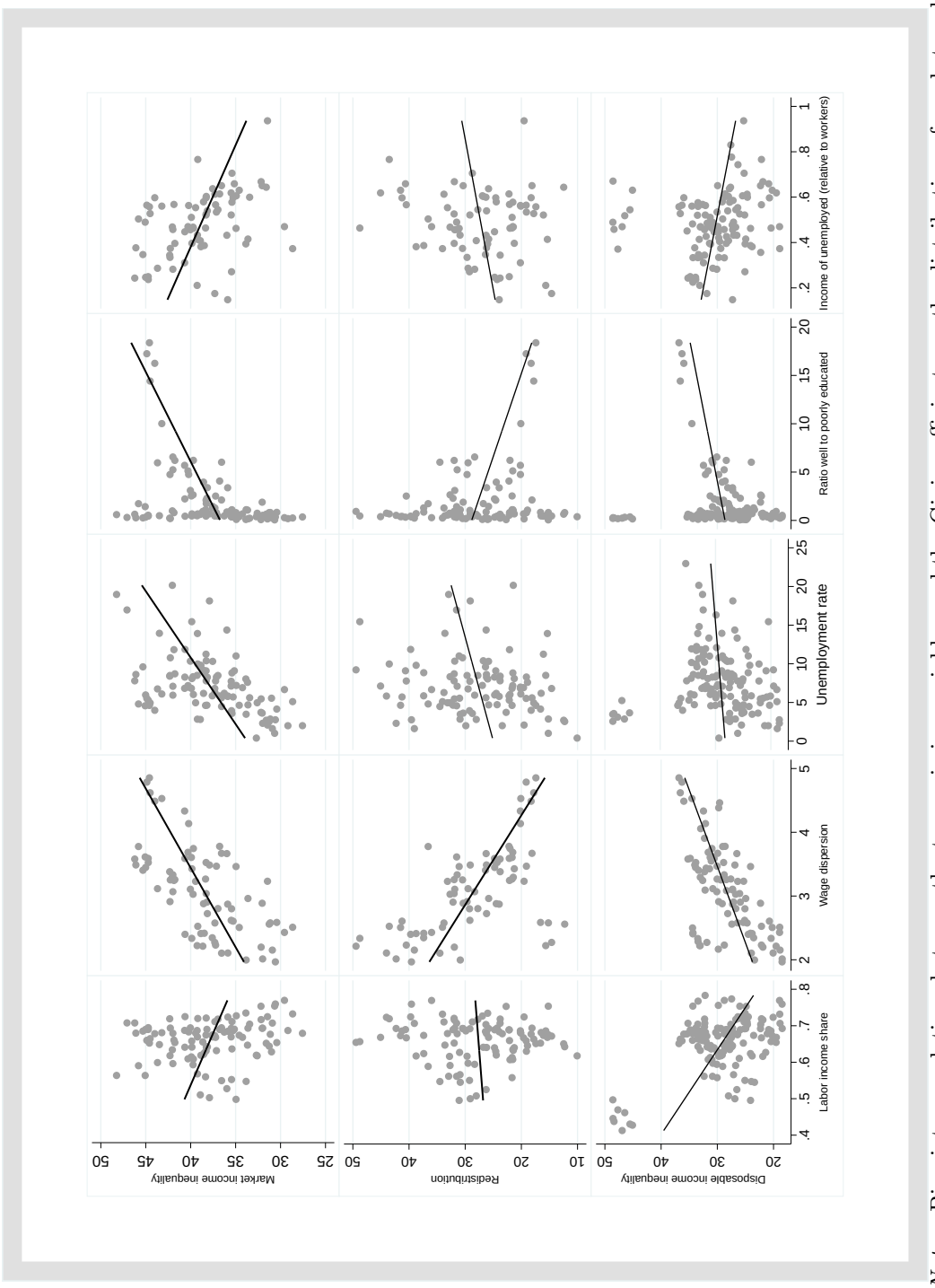


Figure 6.2: Relationship between the transmission mechanisms and the personal distribution of incomes

Notes: Bivariate correlations between the transmission variables and the Gini coefficients on the distribution of market and disposable incomes as well as income redistribution. Information about the variable definitions and data sources is provided in chapter 6.2 and Table A.1.

The third row of Figure 6.2 illustrates the link between the transmission mechanisms and the distribution of disposable incomes. A higher labor income share as well as a higher relative income of unemployed is related to a more equal distribution of disposable incomes. Since higher wage differences increase the inequality in the distribution of market incomes and are negatively related to income redistribution, it is little surprising that the degree of inequality in the distribution of disposable incomes is higher, too, if the distribution of wages is more dispersed.[81] Finally, a higher relative supply of human capital is associated with a greater inequality in disposable incomes.[82]

The subsequent empirical analysis aims at providing information beyond such simple bivariate correlations. In principle, I apply the same basic strategy. To draw conclusions about the impact of trade openness, for instance, on market income inequality, I test how openness affects the various transmission variables and, then, how these impact on the distribution of incomes within the population. The line of argumentation would then be as follows: a higher degree of openness is related to a lower labor income share (compare Figure 6.1). A reduction in the relative rewards of labor is further associated with greater inequality of market and disposable incomes (Figure 6.2). Hence, trade openness is, ceteris paribus, related to a more dispersed income distribution through its effect on the relative income of labor. After this has been done for each transmission variable, the overall effect of globalization on the income distribution in advanced economies can be assessed and, furthermore, the relative effects of the transmission variables can be estimated.

6.1.1 Empirical specification

The following section offers a more formal description of the estimation approach. As described above, I start by examining how globalization influences the transmission mechanisms. For that purpose, I regress the labor income share (θ), wage dispersion (ω), unemployment rate (u), the relative share of human capital (H) and the relative income of unemployed (B) on globalization indicators and a set of further explanatory variables. Hence, the following reduced-form equations are estimated:

[81] Surprisingly, the unemployment rate is not significantly correlated with the distribution of disposable incomes.

[82] However, this seems to be a result of a few influential observations.

$$\theta_{it} = \alpha_1 \cdot G_{it-k} + \alpha_2 \cdot C_{it-k} + \mu_i + \lambda_t + \varepsilon_{it} \tag{6.1}$$

$$\omega_{it} = \beta_1 \cdot G_{it-k} + \beta_2 \cdot C_{it-k} + \mu_i + \lambda_t + \varepsilon_{it} \tag{6.2}$$

$$u_{it} = \gamma_1 \cdot G_{it-k} + \gamma_2 \cdot C_{it-k} + \mu_i + \lambda_t + \varepsilon_{it} \tag{6.3}$$

$$H_{it} = \delta_1 \cdot G_{it-k} + \delta_2 \cdot C_{it-k} + \mu_i + \lambda_t + \varepsilon_{it} \tag{6.4}$$

$$B_{it} = \sigma_1 \cdot G_{it-k} + \sigma_2 \cdot C_{it-k} + \mu_i + \lambda_t + \varepsilon_{it}, \tag{6.5}$$

where G_{it-k} denotes the impact of globalization (i.e. trade openness, imports from non-OECD countries and net exports of capital) included with a time lag of k years.[83] The matrix C_{it-k} contains a set of control variables (with a potential time lag of k years), which may be specific to each equation. μ_i (λ_t) denotes country- (year-) specific fixed effects and ε_{it} is the error term.

The dependent variables of equations 6.1 to 6.5 are then used to explain the evolution of the personal distribution of incomes ($Gini_{it}^M$, $Gini_{it}^D$) or redistribution (R_{it}) based on the following three reduced-form equations:

$$\begin{aligned} Gini_{it}^M &= a_1 \cdot \theta_{it} + a_2 \cdot \omega_{it} + a_3 \cdot u_{it} + a_4 \cdot H_{it} + a_5 \cdot B_{it} \\ &\quad + \nu \cdot \chi_{it} + \mu_i + \lambda_t + \varepsilon_{it} \end{aligned} \tag{6.6}$$

$$\begin{aligned} Gini_{it}^D &= b_1 \cdot \theta_{it} + b_2 \cdot \omega_{it} + b_3 \cdot u_{it} + b_4 \cdot H_{it} + b_5 \cdot B_{it} \\ &\quad + \nu \cdot \chi_{it} + \mu_i + \lambda_t + \varepsilon_{it} \end{aligned} \tag{6.7}$$

$$\begin{aligned} R_{it} &= c_1 \cdot \theta_{it} + c_2 \cdot \omega_{it} + c_3 \cdot u_{it} + c_4 \cdot H_{it} + c_5 \cdot B_{it} \\ &\quad + \nu \cdot \chi_{it} + \mu_i + \lambda_t + \varepsilon_{it}, \end{aligned} \tag{6.8}$$

where χ_{it} contains a set of possible control variables, which may differ between the equations.

The coefficients of the labor market outcomes estimated in equations 6.6 to 6.8 could, in principle, be used to quantify the relative impact of each of these transmission mechanisms on the income distribution. Together with the predicted effects

[83] A time lag is introduced because globalization may not immediately induce an adjustment in labor market outcomes. Moreover, the length of this adjustment process might further differ between the transmission mechanisms and hence the lag length is allowed to vary in the estimation of the equations 6.1 to 6.5.

of the globalization variables estimated based on the first set of equations, these coefficients allow a quantification of globalization-induced changes of the distribution of incomes in industrialized countries.

The empirical analysis is based on a panel data set covering 28 current OECD member countries over the period from 1960 to 2010. The panel is, however, highly unbalanced due to a large number of missing observations and the limited availability of income data. This has several implications for the subsequent empirical analysis. In particular, the number of observations differs considerably between the regressions. To allow a comparison of the relative effects of the transmission mechanisms, the prediction of the quantitative effects is based on a common sample. The number of observations is, in that case, very low, which impedes the identification of significant effects. The strategy of the empirical analysis is thus to use all available observations for the main analysis and the robustness checks in chapter 7. I only restrict the sample to common observations for the estimation of the relative effects of the transmission mechanisms (chapter 8).

The identification of a *causal* effect of globalization on the transmission mechanisms and therewith the income distribution is characterized by difficulties. In particular, the estimated coefficients might be biased by a possible reverse causation and potential confounding factors that influence both a country's openness to international trade or capital mobility and its labor market outcomes as well as income distribution.

The theoretical approaches reviewed in chapter 5 suggest that globalization has an impact on the labor market outcomes considered in this study. Nonetheless, it is possible that the transmission variables themselves affect a country's exposure to globalization. This reverse causation issue is clearly present in the estimation of the relative supply of human capital because the relative endowment with skilled workers determines a country's comparative advantage in international trade and, hence, its structure of trade.[84] A possible reverse relationship could further be driven by trade policies. In particular, a declining labor income share or rising wage dispersion and unemployment rates might increase voters' demand for protectionist measures. Another possible reverse causation exists for the relationship between international

[84] Moreover, the relative supply of human capital may also affect the returns to capital if the elasticity of substitution between physical capital and labor (unskilled labor) differs from that between physical capital and human capital (skilled labor). Several studies (e.g. Griliches (1969), Krusell et al. (2000) and Lindquist (2005)) indeed suggest that elasticity of substitution between capital and skilled labor is greater than the elasticity of substitution between capital and unskilled labor (i.e. that skilled labor is more complementary to capital than unskilled labor).

trade and the relative income of unemployed persons. Janeba (2007) shows that the welfare state itself has an impact on trade volumes. If, in the presence of labor market rigidities, firms' entry into foreign markets require a risky investment, a rise in unemployment benefits induces an increase in exports.[85] Reverse causation problems could also affect the estimates of the second step of the analysis. The level of income redistribution, for instance, is not only affected by the labor market outcomes but has itself an impact on labor market behavior through its effect on the incentives to work or invest into education.

I can neither rule out the existence of a reverse causation problem nor fully solve this problem.[86] To mitigate the problem of reverse causation, I introduce a time-lag for the variables of interest. Although the simple fact that current labor market outcomes are explained by past globalization experience is not sufficient for a causal relationship, it is more reasonable to assume that the labor markets adjust to previous openness experience. Still, the estimated coefficients should rather be interpreted as correlations than as causal effects.

Besides reverse causation issues, the existence of factors, which correlate both with the globalization and the transmission variables or with the latter and the measures of income distribution might further bias the results. If these potential *confounding factors* are not considered in the regressions, then this would induce an omitted variable bias. To avoid this, I apply the following estimation approach. The empirical analysis starts with OLS regressions. The pooled OLS estimates might, however, be biased due to unobserved country-specific effects, which are correlated both with a country's openness to trade or capital mobility and its labor market outcomes or income distribution. To account for a potential heterogeneity between countries (i.e. time-invariant and country-specific omitted variables), I include dummy variables for each country.[87] Moreover, I introduce year fixed effects to capture year-specific factors that are common to all countries (e.g. general

[85] Some firms that enter the export market do not survive and their workers become unemployed. The wage in the export sector depends on the firm's probability of surviving and the respective income workers receive when employed or unemployed (i.e. workers decide about working in the export or non-tradable sector based on their expected income). Since higher unemployment benefits increase the expected wage in the export sector, it allows the firms to lower their wage payments. This reduces the overall production costs and prices of the export good and, hence, increases the export volume.

[86] A possibility to solve these reverse causation problems would be to utilize an exogenous variation in a country's exposure to globalization (e.g. a *natural experiment*). This approach might be feasible if one focuses only on a specific country and question but not in a complex study based on a panel of countries.

[87] To avoid the "dummy-trap" and estimate a constant (which is not reported), one country dummy is omitted from each regression.

macroeconomic conditions).[88] In addition to the fixed effects, I also directly control for various factors that might be correlated with the variables of interest and the independent variables. The choice of the control variables is motivated by findings of comparable studies and by theoretical considerations. In the first step of the empirical analysis, which is described by the equations 6.1 to 6.5, the amount of capital per worker, the labor productivity, the growth of multifactor productivity and the output gap are considered as additional control variables. To capture the institutional framework of a country, I also include a measure for the degree of labor market regulation. The relative income of the unemployed is determined politically and thus both the share of left wing parties in the government and the voter turnout in parliamentary elections is included in the regressions.

The second part of the empirical analysis (see equations 6.6 to 6.8) includes several control variables (denoted by χ_{it}). Considered are those factors that influence how labor market outcomes or welfare state generosity translate into a more or less unequal distribution of incomes among households or those that affect inequality through some independent channels. The following variables have been included: the GDP per capita and its square (controlling for a Kutznets curve effect) as well as the deviation of the annual growth rate of the real GDP from its five-year average.[89] Additionally, the estimations of the extent of income redistribution also take political factors such as the share of left wing parties in the government and voter turnout into account. Several variables have been tested but failed to be significant and are thus not included in the empirical analysis in section 7.2.[90]

Finally, the estimation of the determinants of labor market outcomes (equations 6.1 to 6.5) using OLS might further introduce a simultaneity bias since the residuals (ε_{it}) may be correlated between equations. I address this issue and estimate a system of equations using the seemingly unrelated regressions (SUR) model.

---

88 F-tests of the joint significance of country or year fixed effects are reported in each regression table.

89 The consideration of business cycle effects is motivated by the possibility that changes in the degree of the measured inequality between two years might simply reflect different economic conditions in these years but not actual developments of medium- or long-term inequality trends.

90 These variables are the share of manufacturing employment, age dependency ratio and female labor force participation.

6.1.2 Expected influence of globalization-induced changes of the transmission mechanisms

Now, the expected effects of globalization on the transmission mechanisms as well as their translation into a greater (or lower) inequality of personal incomes are summarized. The former are derived from the hypotheses in chapter 5. The respective sign expectations are summarized in column one of Table 6.1. Based on the hypotheses 1 and 2, international trade and investments of capital abroad are assumed to reduce the labor income share and increase wage dispersion. The overall unemployment rate is expected to rise (especially in the short-run) in response to greater economic integration. The medium- to long-run consequences of international trade are, however, less obvious since it should increase productivity and thus likely create more jobs than it destroys (hypothesis 3).[91] The relative supply of human capital (i.e. the share of well relative to poorly educated individuals within the population) should increase as globalization is expected to have a positive effect on the incentives to invest into education (hypothesis 4). Finally, the overall impact of globalization on the relative income of unemployed persons (as a proxy for the extent of the welfare state) is theoretically ambiguous (hypothesis 5).

Table 6.1: Expected signs

	Transmission mechanism	Impact of globalization	Impact on (disposable) income differences
1.	Labor income share	-	-
2.	Wage dispersion	+	+
3.	Unemployment rate	+/?	+
4.	Relative supply human capital	+	+
5.	Relative income of unemployed	?	-

The expectations regarding the relationship between the transmission mechanisms and the personal distribution of incomes are summarized in column two of Table 6.1. To assess the likely consequences of the transmission variables on the Gini coefficients it is helpful to decompose this measure into various income components. The influence of a certain income component on the personal distribution of market and disposable incomes depends both on its relevance (as a share of total incomes) and its dispersion. For the purpose of this study, I focus on four types of income recipients (a more detailed decomposition of the Gini coefficient is provided

[91] The predictions would be different if e.g. only the unemployment rate for less educated workers were used instead of the aggregate measure.

by Checci and Garcia-Penalosa, 2010): the share of the unemployed persons (u) who receive unemployment benefits (B, which is equal to the income of unemployed relative to workers), unskilled and skilled workers earning the respective wages and some individuals who also own capital and receive capital incomes.

A rising wage dispersion (i.e. difference between the wage of skilled and unskilled workers) increases the inequality within the group of workers and therewith also the overall income inequality. A higher educational attainment in the population and thus a rise in the relative supply of skilled workers is, ceteris paribus, expected to increase inequality (at least as there are more unskilled than skilled workers).[92] A higher labor income share reduces the inequality between capital owners and workers (*between* group inequality) but the effect on the Gini coefficient depends on the inequality of wage incomes versus capital incomes (*within* group inequality). Since capital incomes are usually less equally distributed than earnings, a higher labor income share is expected to reduce inequality. A higher relative income of unemployed persons reduces the inequality between workers and unemployed persons and therefore also the overall income inequality. Moreover, the dispersion of personal distribution of incomes should increase in response to a higher unemployment rate.[93]

6.2 Data

The following section describes the variables used in the empirical analysis. In addition to the variable description in the text, Table A.1 entails further information on the variable definitions and the data sources.

6.2.1 Data on income distribution

My primary source for income distribution data is the Luxembourg Income Study (LIS). LIS collects national micro-datasets and harmonizes them for cross-national income comparisons.[94] Currently, income data is available for 46 high- and middle-

[92] In addition, a higher relative supply of human capital should, other things equal, reduce the earnings dispersion and thereby income inequality. The effect of changes in the distribution of wages on the income distribution is, however, directly captured by the inclusion of this variable.

[93] Theoretically, the impact of a higher share of unemployed persons might be ambiguous because incomes are more equally distributed within the group of unemployed than among workers. This effect does, however, not dominate the rise in between-group inequality unless the majority of the population is unemployed.

[94] More detailed information on LIS is provided at `http://www.lisdatacenter.org`. See also Gornick et al. (2013); Atkinson et al. (1995).

income countries covering up to eight waves (and some historical data) for the period from 1970 to 2010.[95] LIS offers high quality data on incomes and is the best source for cross-country analyses of income inequality that is currently available.[96]

Besides information on different types of income, LIS also entails data on household size and composition required for the analysis of the personal income distribution. The empirical analysis of potential transmission mechanisms through which globalization affects the distribution of incomes requires information on several types of income. Table 6.2 describes the income types I use in this study.

Table 6.2: Definition of income

Compensation of employees
(before deduction of direct taxes and employees' social security contributions)
+ *Gross self-employment income* (net of expenses)
+ *Capital income*: monetary payments received in counterpart
for providing capital (financial and non-financial assets).*
+ *occupational pension income*
= Market income
+ *private transfers* (merit-based education transfers,
transfers from non-profit institutions, and inter-household transfers)
+ *social security transfers*
- *income taxes and social security contributions*
= Disposable income

Notes: * Capital incomes include also voluntary individual pensions (i.e. annuities from life insurance and other pension-like annuities) and thus the third pillar in three-tiered pension schemes. More detailed information on the definition of the income components are provided in Table A.3.

The international mobility of goods and production factors should affect the distribution of primary incomes. I focus therefore on the distribution of incomes

[95] This analysis focuses on developed countries and is therefore limited to current OECD member countries. Table A.2 includes detailed information on the countries and years covered in this study.

[96] For a detailed discussion on reliability of income data (especially of widely used secondary data sets see e.g. Brandolini and Atkinson, 2001).

from paid and self-employment as well as capital within the population. Market incomes further include income from occupational pension schemes. The disposable income as a relevant proxy of economic well-being and consumption opportunities consists of market income plus private[97] and social security transfers received less income taxes and social security transfers paid.[98]

To calculate measures, which describe the income distribution, I have made several decisions e.g. regarding the treatment of negative incomes or the adjustment of household incomes. These decisions regarding data adjustments are described below.

Since household members share available resources and benefit from economies of scale, incomes should be measured at the level of the household rather than for each individual separately. The main interest of this study is, however, on the distribution of personal incomes within the population of industrialized countries. The analysis should therefore be based on the individual. To assign household incomes to individuals, these need to be adjusted to different household sizes using an equivalence scale.[99] I use the so-called "square root equivalence scale", which is an intermediate scale and divides the income of an household by the square root of its size (i.e. the number of household members).

To achieve a representative picture for the total (covered) national population,[100] the household incomes are further weighted. In particular, I have used a household weight, which is multiplied by the number of household members. This procedure allows to produce an estimate of the overall distribution of incomes among individuals in the population.

I made several adjustments in order to enhance the comparability of the esti-

97 The reception of private transfers (e.g. alimony or child support) constitutes a major source of income for some households and should thus be included in the analysis of the income distribution.

98 The LIS income concept is based only on current incomes. This excludes, for instance, all kinds of windfall gains and one-time receipts. LIS data does not include non-monetary incomes from capital such as imputed rents for owner-occupied dwellings (although several non-monetary incomes are included). Furthermore, public services such as housing, care, education, or health are not considered. The implication of this incomplete coverage of non-monetary incomes for cross-national or across time comparisons of income inequality is discussed in Canberra Group (2001).

99 The resulting equivalent income accounts for economies of scale in consumption and, thereby, for the fact that the needs of a household do not grow proportionately with each additional member.

100 Most surveys cover only the non-institutionalized population living in private households. This excludes full-time military, the homeless and the institutionalized (nursing home residents, other long-term sanatarium and hospital patients, and prisoners). Insofar, the data allows drawing conclusions on the non-institutionalized, private population in the respective country and year.

mated inequality measures both across countries and over time. Households reporting zero or negative disposable incomes have been excluded because these incomes are likely biased by measurement error. Since the treatment of zero, negative or high incomes differs between the original surveys collected by LIS, I applied a uniform top- and bottom-coding procedure to improve the comparability of the results. The bottom-coding procedure sets all incomes below one percent of the equivalent mean income equal to this value. The top-coding procedure replaces all (unequivalent) incomes higher than ten times the median income by this value.

The labor force participation differs between age groups and these differences likely vary both across countries and over time. Since globalization is expected to affect the distribution of incomes mainly through market forces, its impact should be strongest for individuals who participate in the labor market.[101] Hence, the analysis is confined to households with a working-age head (aged 25 to 64 years). The household head has then most likely completed schooling but not yet reached legal retirement age in most countries.

I use the Gini coefficient as key indicator of income differences. This common summary measure is equal to the ratio of the area between the line of equality and the Lorenz curve and the total area under the line of equality. More formally, the Gini coefficient can be defined as follows:

$$G = \left(\frac{1}{2n^2\mu}\right) \sum_{i,j=1}^{n} |Y_i - Y_j|,$$

where n denotes the number of individuals in the population, μ is the mean equivalent income in the population and Y_i (Y_j) is the equivalent income of the i^{th} (j^{th}) person in the population.[102]

In case of complete equality, i.e. when all persons have the same level of income, the Gini coefficient is equal to zero. When all income is received by one person (i.e. complete inequality), the Gini coefficient is equal to one. Hence, a higher value of the Gini coefficient is associated with a higher degree of inequality.

The dependent variables are the Gini coefficients of MARKET INCOME INEQUALITY and of DISPOSABLE INCOME INEQUALITY. Moreover, the variable REDISTRIBU-

[101] The main focus of this study is on the distribution of market-generated incomes. To limit the influence of differences in labor market participation behavior between different countries and over time, I have decided to focus only on household with a working-age head. This adjustment is common in the literature (see e.g. Mahler, 2004) and also chosen by the OECD for the calculation of summary measures for income distribution (see OECD, 2008, 2011).

[102] This formula indicates that income differences between two wealthy and two poor individuals have the same effect on the Gini coefficient.

TION is calculated based on these two measures: the difference in the Gini coefficient of market and disposable income distribution as a percentage of the Gini coefficient of market income distribution. Consequently, this variable measures the inequality-reducing effect of redistribution through taxes and transfers.

The LIS surveys are only available for a few years and several surveys are not based on a gross income concept (i.e. offer also data on incomes before the deduction of taxes), which is required for the calculation of market income inequality.[103] Therefore, the number of observations is rather low and also differs, depending on the income concept, between the empirical analyses. Despite the difficulties and limitations for an empirical analysis based on only few observations, I prefer the use of LIS data over alternative sources. Several other studies employ only one measure of the personal distribution of incomes, which is often not based on a uniform income concept (i.e. does not distinguish between gross and net incomes for several countries). The use of inequality measures without a distinction between gross and net income concepts introduces a measurement error that depends on the extent of income redistribution. Hence, empirical analyses based on such data likely produce biased results. Some studies (e.g. Checci and Garcia-Penalosa, 2010) try to solve this problem by including dummy variables that indicate whether a certain observation is based on net or gross incomes. This approach is, however, based on the unrealistic assumption that the differences in the Gini coefficients of market and disposable incomes and therewith the extent of income redistribution is the same for all countries and does not change over time.[104]

6.2.2 Data on transmission mechanisms

The basic choice of the transmission mechanisms through which globalization should affect the personal distribution of incomes is motivated by theoretical reasoning (see chapter 5). The relevant variables have already been introduced in the discussion of the empirical approach at the beginning of this chapter.

The variable LABOR INCOME SHARE is defined as the ratio of the total labor

[103] I follow the LIS practice and name data sets, which offer information on wage, self-employment and capital incomes gross of taxes and social security contributions "gross data sets". Data sets reporting incomes only net of taxes and contributions are called "net data sets". While the distinction between gross and net data sets is based on the income concept employed in LIS surveys, market and disposable incomes refer to the definition of the income distribution variables used in this study.

[104] A discussion of the types of error resulting from such a procedure and its impact on the reliability of the inequality measure is provided in the appendix A.1.1.

costs[105] and the nominal output (i.e. is equal to the real unit labor costs). This variable measures the share of national income, which accrues to the factor labor and thus the distribution of income between labor and capital. A greater labor income share indicates higher overall payments to labor relative to capital.

The relative income of skilled versus unskilled workers is proxied by a measure of wage differentials provided by the OECD. The variable WAGE DISPERSION is equal to the decile ratio (i.e. the ratio between the 9^{th} and the 1^{st} decile) of gross wages of full-time employees. Note that the distribution of gross earnings is no ideal indicator for the skill premium since a substantial degree of wage inequality is, for instance, observable within the group of educated workers. A better approach would be a direct measurement of the gross wages of workers at different levels of educational attainment. To my knowledge, however, no such data is available for a sufficiently large number of countries and years.[106]

The variable UNEMPLOYMENT RATE is defined as unemployment as a percentage of the civilian labor force[107] and thus indicates the incidence of unemployment.

The relative supply of human capital is measured as the share of well versus poorly educated individuals in the population over 25 years. This information is taken from a data set on educational attainment constructed by Barro and Lee (2012). Using information on educational attainment from survey or census data, Barro and Lee estimate educational attainment rates for five-year age groups and extrapolate the shares of different educational groups in the population of 146 countries from 1950 to 2010.[108] The variable RELATIVE SUPPLY OF HUMAN CAPITAL is equal to the number of individuals with tertiary education divided by those for whom primary education is the highest educational degree (both expressed as a

[105] The total labor costs include the compensation of employees and self-employed and thus essentially measure the total labor income. The adjustment for self-employment relies on the assumption that the labor compensation per hour is the same for self-employed and employees. Since the validity of this assumption differs across countries and industries, the comparability of the results is likely to be affected. A comment on this issue and more information on the construction of this variable is provided in the documentation of the data set (see OECD, 2013c).

[106] I have used LIS data to calculate the gross wages of workers with completed tertiary education relative to those with less than secondary education. The number of observations is too small for the purpose of this study but the correlation coefficient between this measure and the earnings dispersion variable is 0.65.

[107] The civilian labor force is defined as the sum of employed and unemployed persons excluding armed forces.

[108] A detailed description of the data set and its construction can be found in Barro and Lee (2012) and online at `www.barrolee.com`. The version used in this study differs from earlier data on educational attainment provided by Barro and Lee (1993, 1996, 2000). The data is available at five-year intervals. For the purpose of the empirical analysis, I have filled the gaps between these intervals by interpolation and assumed a linear trend in educational attainment.

percentage of the population older than 25 years).

Finally, I consider the extent of government redistribution through the welfare state and the social security system as a further transmission mechanism. To measure welfare state generosity, I focus on the relative net income of unemployed persons compared to that of employees. The relative amount of incomes which individuals receive in case of unemployment is likely to depend on a country's exposure to international trade and capital mobility (see section 5.3). Transfer payments to the unemployed are an adequate transmission mechanism since they are closely related to the insurance function of the welfare state. Consequently, this variable is closely related to the demand-side effect of globalization on income redistribution as suggested by Rodrik (1998) (see hypothesis 5 (b.2)). This variable should therefore be particularly suitable for testing the competing hypotheses regarding the relationship between globalization and redistribution (i.e. hypothesis 5 (a) versus (b)). Moreover, the income of unemployed relative to employed individuals should have a substantial impact on the income distribution. If unemployment rises, then the increase in disposable income inequality will, ceteris paribus, be stronger in countries with a lower relative income of unemployed workers. To measure the relative income of unemployed, I employ LIS data. The mean incomes are calculated based on the total disposable income (i.e. sum of labor, capital and transfer income received less the payment of direct taxes and social security contributions) at the individual level. The variable RELATIVE INCOME OF THE UNEMPLOYED is equal to the ratio of the average disposable income of unemployed individuals to the average disposable income of employees. This approach differs somewhat from the OECD calculations of the net replacement rates (OECD, 2007), which are based on simulations. The replacement rates of unemployed persons are specified as the average of different durations of unemployment, family situations and assumptions about spouse's income.[109] The net replacement rates have only been available since 2001 and are thus

[109] Further information is also provided at `www.oecd.org/els/social/workincentives`. In contrast to the OECD simulations, my calculations do not distinguish between different types of unemployment (e.g. short- and long-term) and family situations. The length of an unemployment spell is, however, likely related to the type and amount of compensation an unemployed person is eligible for. I further focus on the individual and not on the equivalent household income because the latter is also affected by the employment status and income reception of other household members. This would be misleading since the main interest is on the question how unemployment affects the income of the person who becomes unemployed. It should, however, be mentioned that transfer payments might depend on, for instance, the number of children or the income of the spouse. The variable RELATIVE INCOME OF THE UNEMPLOYED refers to the relative income of all types of unemployed, independent of the duration and eligibility rules and, hence, may not only reflect the design of the transfer system but also the composition of the unemployed population.

not suitable for the subsequent empirical analysis. Several studies have also focused on gross replacement rates, which are, however, less appropriate for the generosity of unemployment compensation (see e.g. Howell and Rehm, 2009).

6.2.3 Globalization data

The first indicator for a country's economic integration is its openness to international trade defined as the ratio between trade in goods and services (i.e. the sum of exports and imports) and GDP. The variable TRADE OPENNESS serves as an indicator for the overall exposure to international trade and thus is used to measure the impact of trade on the distribution of incomes.

In particular neoclassical trade theories emphasize the relevance of trade with less developed countries for the income distribution in advanced economies. Hence, the relative importance of trade with non-OECD member countries is included as a further trade measure. The variable NON-OECD IMPORTS is equal to the share of imports from non-OECD countries (excluding those from OPEC states[110]) in an economy's total imports. To reduce the influence of outliers, I express both variables in logs.

The extent of capital mobility is measured as following: based on the considerations in section 5.1, I use the net exports of private capital (i.e. outflows *minus* inflows of foreign direct, portfolio and other investments) as a share of GDP.[111] The variable NET CAPITAL EXPORT is based on the idea that the international mobility of private capital, ceteris paribus, affects the domestic capital stock and thereby the factor rewards. This effect should not depend on the specific type of capital (as long as it is invested) and therefore a distinction between FDI, portfolio and other investments is not necessary. To check the robustness of the impact of capital mobility, I also use a measure of gross capital movements (i.e. the sum of inflows and outflows of private capital) as a percentage of GDP and net exports of FDI. The latter is motivated by the observation that most empirical studies which analyze the effects of international capital flows focus only on FDI.[112]

[110] Imports from OPEC countries should be dominated by petroleum, which is not expected to have similar effects on the income distribution as manufacturing imports. To avoid an imprecise measurement, the petroleum-exporting countries are not included in the construction of this variable.

[111] This variable takes on negative values if a country is a net importer of capital. Hence, no logarithm is used because this would lead to a loss of these observations.

[112] Possible explanations for this confined measure might be the relevance of FDI as a long-term investment, potential additional effects related to the managerial involvement of an FDI relative to a portfolio investor or that foreign direct investments are compared to foreign loans

6.2.4 Control variables

Several additional explanatory variables are included in the following empirical analyses.[113] Due to a limited number of observations, in particular, in the regressions of market and disposable income inequality and redistribution on the transmission variables, I mostly include those variables that have been proven significant at least at the 10%-level in the baseline regressions.

Hence, the following control variables are included in the analysis of the transmission mechanisms. The relative capital endowment is measured as the amount of CAPITAL PER WORKER (in logs) and is used as an explanatory variable in the analysis of the labor income share, the wage dispersion, the unemployment rate and the relative supply of human capital. Moreover, a measure for LABOR PRODUCTIVITY is included in the regressions of the labor income share and the unemployment rate, whereas the growth of MULTIFACTOR PRODUCTIVITY is employed as an indicator for productivity shocks in the analysis of the relative supply of human capital. Moreover, the OUTPUT GAP captures the impact of business cycle effects in the regressions of the unemployment rate. The latter is used as a control for e.g. demand shocks, which affect domestic production (and thus employment) but also imports, and thus might introduce a omitted variable bias if not included in the regressions.

One aspect which should affect all examined labor outcomes is the institutional framework of a country. In particular, globalization and its impact on labor demand likely depends on the degree of labor market regulation. To measure the degree of regulation of the labor market, I use the Economic Freedom of the World (EFW) Index from the Fraser Institute (Gwartney et al., 2012). The subindex labor market regulation assesses the freedom of employers and employees based on the following types of regulations: minimum wages, hiring and firing regulation, centralized collective bargaining, hours regulation, mandated costs of worker dismissals and conscription. A higher value of this index and thus of the variable LABOR MARKET FREEDOM is equal to more economic freedom and less regulated labor markets.[114]

The set of control variables employed in the empirical analysis of the relative income of unemployed individuals differ from those included in the other regressions. This is due to the fact that the amount of transfer incomes received by unemployed

or credits (i.e. other investments) subject to stronger controls at country level (see section 5.1).

[113] A detailed description of the variables and the data sources is provided in Table A.1.

[114] It might, however, be the case that not only the degree of labor market regulation affects the examined labor market outcomes but the causation goes from these outcomes to the regulation of labor markets. A greater dispersion of wages, for instance, could raise voters' demand for minimum wages and related regulations of the labor market.

persons is determined politically. Hence, I consider both the share of left wing parties in the government (LEFT GOVERNMENT) and the VOTER TURNOUT in parliamentary elections in the empirical analysis.

In the analyses of the Gini coefficients on market and disposable income inequality as well as redistribution the following control variables are included: the GDP PER CAPITA and its square (controlling for a Kutznets curve effect) as well as the DEVIATION OF THE REAL GDP GROWTH from its five-year average. The inclusion of the latter is motivated by the possibility that the measured level of inequality depends on the economic conditions in the year to which the survey data refers. A change in the measured level of income inequality might solely reflect business cycle effects but not actual trends in inequality (i.e. the Gini coefficient might change simply because one compares observations from a boom phase and a recession). Insofar, the inclusion of the deviation from the real GDP growth rate is motivated by a different reasoning than the inclusion of the output gap in the empirical analysis of the unemployment rate. As in the empirical analysis of the relative income of unemployed persons, the variables LEFT GOVERNMENT and VOTER TURNOUT are included in the analysis of income redistribution. Several variables have been tested but failed to be significant and are thus not included in the empirical analyses in section 7.2.[115]

The summary statistics for the variables employed in the main regressions are reported in Table 6.3. Furthermore, the correlations between the variables are reported in Table 6.4. The correlations between the explanatory variables are below an absolute value of 0.70.[116]

[115] These variables are the share of manufacturing employment, age dependency ratio and female labor force participation.

[116] Only the correlation coefficient between growth in multifactor productivity and labor productivity is 0.79.

Table 6.3: Summary statistics: main variables

Variable	Mean	Std. Dev.	Min.	Max.	N
Income inequality and redistribution					
Disposable income inequality	28.823	6.167	18.461	48.589	171
Market income inequality	38.346	5.061	27.566	51.914	122
Redistribution	28.121	8.537	10.076	49.442	121
Transmission mechanisms					
Labor income share	0.66	0.095	0.384	0.985	1222
Wage dispersion	3.191	0.769	0.817	5.375	563
Unemployment rate	5.712	4.11	0	24.171	1411
Relative supply of human capital	1.195	6.073	0.015	148.474	1683
Relative income of unemployed	0.476	0.121	0.148	0.936	410
Globalization					
Trade openness (log)	3.966	0.695	2.206	5.891	1262
Non-OECD imports (log)	2.639	0.557	-0.1	3.941	1378
Net capital exports	-2.085	7.096	-82.83	52.517	1144
Control variables					
Labor productivity	2.203	2.448	-10.94	18.048	1021
Capital per worker (log)	2.559	0.272	1.716	3.676	624
Labor market freedom	5.247	1.495	2.81	9.130	1032
Output gap	-0.036	3.009	-11.681	13.442	794
Multifactor productivity	1.15	1.674	-7.600	7.600	459
Left government	32.622	37.154	0	100	1132
Voter turnout	78.522	13.166	35	95.8	1134
GDP per capita	23028.123	9885.935	2431.692	73912.586	1278
Devation real GDP growth	0	2.463	-16.905	10.498	1476

Table 6.4: Correlations between main variables

	Disp. inc. inequ.	Market inc. inequ.	Redistr.	Labor inc.	Wage disp.	Unempl. rate	Rel. supply hum. cap.	Rel. inc. unempl.	Trade open.	Non-OECD imp.	Net cap. exp.	Labor . prod.	Cap. p. worker	Labor market free.	Output gap	Multif. prod.	Left gov.	Voter turn.	GDP p.c.	Dev. r. GDP gr.
Disp. inc. ineq.	1.00																			
Market inc. ineq.	0.75	1.00																		
Redistr.	-0.66	-0.00	1.00																	
Labor inc.	-0.45	-0.21	0.02	1.00																
Wage disp.	0.66	0.69	-0.50	0.17	1.00															
Unempl. rate	0.09	0.50	0.20	-0.07	-0.07	1.00														
Rel. supply hum. cap.	0.22	0.37	-0.25	-0.12	-0.00	-0.00	1.00													
Rel. inc. unempl.	-0.14	-0.40	0.11	0.10	-0.04	-0.13	0.08	1.00												
Trade open.	-0.28	0.03	0.32	-0.16	-0.14	0.08	0.04	-0.13	1.00											
Non-OECD imp.	0.13	0.34	-0.16	0.00	0.46	0.11	0.13	-0.13	-0.24	1.00										
Net capital exp.	-0.20	-0.19	0.13	0.05	-0.27	-0.09	0.10	0.03	-0.01	-0.19	1.00									
Labor prod.	-0.03	0.09	0.22	0.09	0.20	-0.01	-0.10	-0.05	-0.01	-0.00	-0.06	1.00								
Capital p. worker	0.03	-0.08	-0.19	-0.05	-0.14	-0.42	0.19	0.00	0.12	-0.23	0.17	-0.25	1.00							
Labor market free.	0.35	0.40	-0.44	-0.34	0.44	-0.12	0.09	-0.10	-0.01	0.25	-0.20	-0.12	0.05	1.00						
Output gap	-0.02	-0.13	-0.16	-0.05	-0.01	-0.36	0.04	0.00	0.14	-0.03	-0.17	0.03	0.36	0.04	1.00					
Multif. prod.	-0.00	0.20	0.25	0.21	0.21	0.01	-0.03	0.03	0.01	0.06	0.16	0.79	-0.11	-0.11	0.03	1.00				
Left gov.	-0.17	-0.22	0.16	0.06	-0.27	0.07	0.01	-0.06	0.11	-0.06	0.00	0.05	-0.03	-0.26	-0.01	-0.01	1.00			
Voter turn.	-0.42	-0.20	0.51	0.09	-0.63	-0.12	-0.12	-0.13	0.21	-0.17	-0.08	0.09	0.26	-0.48	-0.03	0.02	0.18	1.00		
GDP p.c.	-0.20	0.14	-0.08	-0.09	-0.19	-0.13	0.27	-0.00	0.45	-0.19	0.27	-0.34	0.57	0.28	0.14	-0.29	-0.01	-0.20	1.00	
Dev. r. GDP gr.	0.11	0.08	0.01	-0.06	0.00	-0.04	0.02	-0.06	0.02	-0.03	-0.04	0.49	0.08	-0.01	0.47	0.46	-0.02	0.01	0.02	1.00

Chapter 7

Results

The subsequent chapter presents the results of the empirical analysis. First, I focus on the transmission mechanisms that should be affected by international trade and capital mobility (section 7.1). Second, I analyze how these transmission mechanisms affect the personal distribution of disposable and market incomes as well as income redistribution in industrialized countries (section 7.2). The robustness of the main results is tested using alternative explanations, different empirical specifications and estimators.

7.1 Globalization and labor market outcomes

In the following, I test empirically how trade openness, imports from non-OECD countries and net exports of private capital affect a country's labor income share, wage dispersion, unemployment rate, the relative supply of human capital and the income of unemployed persons relative to workers.

To enhance the comparability of the results, the empirical approach for the baseline estimations reported in this section is the same for each dependent variable. I gradually introduce the explanatory variables: column (1) to (3) of each Table show the bivariate correlations between the transmission variables and each globalization indicator, whereas column (4) reports the results of the joint analysis of all globalization variables. Finally, specifications (5) to (7) include further control variables.

As described in section 6.1.1, the empirical analysis starts with pooled OLS regressions and then introduces country and year fixed effects. The explanatory variables (i.e. the globalization and control variables) are introduced with a time lag of one year in the empirical analyses of the labor income share, wage dispersion, unemployment rate and the relative income of unemployed persons. A lag of five

years is chosen for the analysis of the relative supply of human capital. Consequently, the transmission variables are explained by the level of explanatory variables in the preceding year or their level five years ago. I chose to lag the explanatory variables because this approach should mitigate (though not fully solve) a bias introduced by a potential reverse causation between the transmission variables and the right-hand side variables. More importantly, trade theories suggest that the mechanisms through which globalization affects labor market outcomes are highly complex. It is therefore unlikely that a greater (or lower) openness to international trade and capital mobility have immediate effects on domestic labor markets and change the outcomes of interest in the same year. For some control variables such an immediate impact is more likely (i.e. the introduction of a minimum wage should limit the wage differential without a time lag). To distinguish between the impact of globalization and the other explanatory variables, I chose the same lag length to avoid that the estimated globalization effects are biased by the possibility that globalization influences the transmission variables through the other covariates.[117]

7.1.1 Main results

Determinants of the labor income share

The first transmission mechanism is the share of national income that accrues to labor. The results of the OLS regressions are presented in Table 7.1. The bivariate regressions reported in the first three columns indicate that trade openness is significantly negatively and net exports of private capital are significantly positively correlated with the labor income share, whereas the share of imports from non-OECD countries fails to be significant.

After the inclusion of further explanatory variables, the results suggest that the labor income share is lower in countries, which are more open to international trade or have a higher share of imports from developing countries. Net outflows of private capital, however, do not seem to be significantly related to the relative rewards of labor in industrialized countries.

Overall, the low value of the adjusted R^2 of 0.0145 (see column (4)) points at a limited explanatory power of globalization for the evolution of the labor income share. The explanatory power increases substantially when the economy's capital endowment and labor productivity are included as additional controls. Only labor

[117] The sensitivity of the results toward variations in the length of the time lag is tested in section 7.1.3.

productivity, however, reaches a conventional level of significance if the degree of labor market freedom is also taken into account.[118] The significant and negative coefficient of the labor market freedom index indicates that countries with less regulated labor markets also have a lower labor income share.[119] Finally, the linear time trend points at a decline in the relative rewards of labor over time.

Table 7.2 presents the results of the fixed effects regressions (FEM) including country and partly also year fixed effects. The results of the fixed effects model differ from those obtained by pooled OLS regressions and the F-tests of the joint significance of the country and year fixed effects justify their inclusion.

The results are in line with hypotheses 1 and 2 as outlined in chapter 5: trade openness and the share of imports from developing countries are still negatively related with the labor's share of national income. Moreover, net exports of private capital are now associated with falling relative labor incomes.[120] The latter effect is also robust to the inclusion of the other globalization indicators and further controls, whereas trade openness and the share of imports from developing countries partly fail to be significant. Trade openness is only significant if year fixed effects are included and further the degree of labor market flexibility is not taken into account. Imports from non-OECD countries are generally insignificant in regressions including year fixed effects. This may indicate that the exposure to imports from less developed countries is correlated with another trend variable (e.g. capital-augmenting technological change), which could explain industrialized countries' reduction in labor income share over the recent decades.[121]

[118] The considerable rise of the overall explanatory power of the regressions after the inclusion of further variables, which are, however, not significant (see column (5)) could be an indicator for the presence of multicollinearity. The pairwise correlations shown in Table 6.4 do not support this since they are well below a critical value of 0.7. Moreover, the mean *variance inflation factor (VIF)* reported in Table 7.1 does not indicate multicollinearity as its value is below the rule-of-thumb of ten and this also applies to each variable's VIF.

[119] The negative correlation between the degree of labor market freedom and the labor income share could also be caused by a third factor such as the government's ideology. Left governments may be more likely to introduce measures to both increase the labor income share and the degree of labor market regulation. Hence, the significantly negative coefficient of labor market freedom may simply reflect the impact of government ideology on both variables. To test whether such a common cause interdependence is a likely explanation, I include the share of left wing parties in the government as a further control variable (results are not reported). The influence of labor market regulation, however, remains robust and the presumption that this correlation merely reflects the impact of government ideology is thus not confirmed.

[120] Net capital exports directly affect the labor income share because they reduce the amount of capital in the exporting country. Hence, the labor income share should, ceteris paribus, increase because the amount of capital decreases but not because labor receives higher incomes. This endowment effect should, however, at least partly be captured by the inclusion of the capital stock per worker.

[121] This issue is further analyzed in section 7.1.3.

Table 7.1: Labor income share (pooled OLS)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Trade openness$_{(t-1)}$ (log)	-0.0210***			-0.0181***	-0.0448***	-0.0405***	-0.0302***
	(0.0038)			(0.0048)	(0.0038)	(0.0037)	(0.0059)
Non-OECD imports$_{(t-1)}$ (log)		0.0031		-0.0061	-0.0359***	-0.0456***	-0.0345***
		(0.0048)		(0.0066)	(0.0067)	(0.0068)	(0.0070)
Net capital exports$_{(t-1)}$			0.0008**	0.0005	0.0006	-0.0002	-0.0002
			(0.0004)	(0.0003)	(0.0006)	(0.0006)	(0.0005)
Capital per worker$_{(t-1)}$ (log)					-0.0040	0.0166	0.0195
					(0.0145)	(0.0166)	(0.0166)
Labor productivity$_{(t-1)}$					-0.0026	-0.0041*	-0.0045**
					(0.0022)	(0.0022)	(0.0022)
Labor market freedom$_{(t-1)}$						-0.0109***	-0.0106***
						(0.0019)	(0.0019)
Time trend							-0.0010**
							(0.0004)
Adj. R-Square	0.0233	0.0006	0.0019	0.0145	0.2037	0.2794	0.2841
Observations	1182	1083	1043	950	512	485	485
Main VIF				1.03	1.09	1.14	1.70

Notes: OLS regressions. Robust standard errors are reported in parentheses. ***/**/* denotes significance at the 1/5/10%-level.

Table 7.2: Labor income share (FEM)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Trade openness$_{(t-1)}$	-0.0797***	-0.0381***					-0.0828***	-0.0350***	-0.0733***	-0.0168	-0.0805***	-0.0330**	-0.0437***	-0.0330**
(log)	(0.0041)	(0.0119)					(0.0056)	(0.0118)	(0.0074)	(0.0158)	(0.0074)	(0.0151)	(0.0142)	(0.0151)
Non-OECD			-0.0505***	-0.0143**			0.0017	-0.0004	-0.0167**	-0.0079	-0.0242***	-0.0011	-0.0162*	-0.0011
imports$_{(t-1)}$ (log)			(0.0048)	(0.0069)			(0.0059)	(0.0069)	(0.0072)	(0.0094)	(0.0078)	(0.0095)	(0.0083)	(0.0095)
Net capital					-0.0017***	-0.0015***	-0.0016***	-0.0015***	-0.0015***	-0.0012***	-0.0019***	-0.0016***	-0.0017***	-0.0016***
exports$_{(t-1)}$					(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0002)	(0.0002)	(0.0003)	(0.0003)	(0.0003)	(0.0003)
Capital per									0.0382***	0.0462***	0.0282***	0.0303***	0.0251***	0.0303***
worker$_{(t-1)}$ (log)									(0.0076)	(0.0077)	(0.0079)	(0.0077)	(0.0081)	(0.0077)
Labor productivity$_{(t-1)}$									0.0012*	0.0018**	0.0009	0.0013*	0.0005	0.0013*
									(0.0007)	(0.0008)	(0.0007)	(0.0008)	(0.0007)	(0.0008)
Labor market											0.0086***	0.0137***	0.0083***	0.0137***
freedom$_{(t-1)}$											(0.0020)	(0.0027)	(0.0020)	(0.0027)
Time trend													-0.0013***	-0.0015***
													(0.0004)	(0.0006)
Year fixed effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R-Square	0.7995	0.8147	0.7392	0.8032	0.7471	0.8453	0.8286	0.8396	0.8838	0.8938	0.8930	0.9030	0.8953	0.9030
Observations	1182	1182	1083	1083	1043	1043	950	950	512	512	485	485	485	485
F-test	190.6659	104.4880	230.1810	26.9249	135.8468	13.2205	276.0075	2.5084	222.1958	1.8946	221.3121	2.0327	216.6681	1.8356
p-value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0013	0.0000	0.0004	0.0000	0.0024

Notes: Fixed effects estimations. Robust standard errors are reported in parentheses. ***/**/* denotes significance at the 1/5/10%-level. The F-tests provide information on the joint significance of country or year fixed effects (if the latter are included).

Labor market freedom, the amount of capital per worker and partly also labor productivity have now a significant positive effect on the labor income share. This indicates that a country's labor income share increases if the amount of capital per worker increases or labor markets become more flexible.[122] Moreover, the time trend still indicates a general downward trend in the labor income share.

Determinants of the wage dispersion

The wage differential, as a second transmission variable, proxies the wages of skilled (well educated) relative to unskilled (poorly educated) workers. The results of the OLS regressions are shown in Table 7.3. The bivariate regressions indicate that wage dispersion is negatively related with trade openness as well as net exports of private capital and positively with the share of imports from non-OECD countries.

The effect of net export of capital remains robust but the significance of trade openness and non-OECD imports is partly affected by the inclusion of further controls.[123] Among the further control variables only the degree of labor market freedom is significantly and robustly related to earnings dispersion, which is greater in countries with less regulated labor markets. Finally, a positive and marginal significant time trend points at an increase in wage dispersion that is common to all countries.

To account for a possible heterogeneity among different countries, Table 7.4 presents the fixed effects estimates. The signs of the coefficients are in line with the theoretical expectations (see hypotheses 1 and 2). Both trade openness[124] and imports from developing countries are now positively related to the wage differential. Net exports of capital fail to be significant. Again, the relative capital endowment is mostly insignificant, whereas less regulated labor markets are associated with a higher wage inequality. The time trend is significantly positive only if year fixed effects are not included.

---

[122] By controlling for time-invariant and country-specific effects, the fixed effects model focuses on changes *within* countries, whereas the pooled OLS regressions utilize both variation within and between countries. The difference between the two estimated effects of labor market regulation could be interpreted as follows: countries with highly regulated labor markets also have a higher labor income share but a further liberalization of labor markets in a certain country may be beneficial for labor.

[123] In particular, the share of imports from developing countries is statistically significant only in specifications that do not account for differences in labor market institutions.

[124] The negative effect of trade openness in the OLS regressions is thus likely driven by unobserved and country-specific factors.

Table 7.3: Wage dispersion (pooled OLS)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Trade openness$_{(t-1)}$ (log)	-0.1523***			-0.0181	-0.1883***	-0.2301***	-0.3100***
	(0.0436)			(0.0406)	(0.0420)	(0.0406)	(0.0733)
Non-OECD imports$_{(t-1)}$ (log)		0.8023***		0.6839***	0.4185***	0.0720	-0.0024
		(0.0744)		(0.0805)	(0.1131)	(0.1091)	(0.1232)
Net capital exports$_{(t-1)}$			-0.0367***	-0.0287***	-0.0421***	-0.0349***	-0.0356***
			(0.0050)	(0.0042)	(0.0053)	(0.0050)	(0.0051)
Capital per worker$_{(t-1)}$ (log)					-0.2977**	-0.1216	-0.1677
					(0.1458)	(0.1511)	(0.1513)
Labor market freedom$_{(t-1)}$						0.1623***	0.1583***
						(0.0171)	(0.0171)
Time trend							0.0082*
							(0.0048)
Adj. R-Square	0.0170	0.2169	0.0938	0.2848	0.3032	0.4408	0.4438
Observations	554	534	535	506	354	338	338
Mean VIF				1.10	1.13	1.27	1.81

Notes: OLS regressions. Robust standard errors are reported in parentheses. ***/**/* denotes significance at the 1/5/10%-level.

Table 7.4: Wage dispersion (FEM)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Trade openness$_{(t-1)}$ (log)	0.2310***	0.3552***					0.4478***	0.6851***	0.4222***	0.2970***	0.3794***	0.3008**	0.1169	0.3008**
	(0.0559)	(0.1051)					(0.0457)	(0.1065)	(0.0679)	(0.1123)	(0.0721)	(0.1184)	(0.0949)	(0.1184)
Non-OECD imports$_{(t-1)}$ (log)			0.4945***	0.1173*			0.1365***	0.2626***	0.1212**	0.2002*	0.0507	0.3027**	-0.0076	0.3027**
			(0.0385)	(0.0696)			(0.0386)	(0.0630)	(0.0529)	(0.1044)	(0.0727)	(0.1364)	(0.0794)	(0.1364)
Net capital exports$_{(t-1)}$					-0.0012	-0.0021	0.0011	0.0017	0.0004	0.0007	0.0013	0.0010	0.0009	0.0010
					(0.0024)	(0.0020)	(0.0018)	(0.0021)	(0.0026)	(0.0023)	(0.0026)	(0.0024)	(0.0022)	(0.0024)
Capital per worker$_{(t-1)}$ (log)									0.1182	0.3133***	0.1283	0.2052	0.1890	0.2052
									(0.1014)	(0.1153)	(0.1106)	(0.1258)	(0.1149)	(0.1258)
Labor market freedom$_{(t-1)}$											0.0402**	0.0400*	0.0321*	0.0400*
											(0.0194)	(0.0231)	(0.0185)	(0.0231)
Time trend													0.0100**	-0.0000
													(0.0039)	(0.0033)
Year fixed effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R-Square	0.9086	0.9330	0.9110	0.9296	0.9037	0.9271	0.9420	0.9425	0.9355	0.9385	0.9358	0.9389	0.9373	0.9389
Observations	554	554	534	534	535	535	506	506	354	354	338	338	338	338
F-test	520.8241	2.0e+11	3.0e+03	3.7067	391.5504	4.4967	2.3e+03	4.6571	667.7426	3.7980	315.6713	18.5129	372.7793	15.5154
p-value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Notes: Fixed effects estimations. Robust standard errors are reported in parentheses. ***/**/* denotes significance at the 1/5/10%-level. The F-tests provide information on the joint significance of country or year fixed effects (if the latter are included).

Determinants of the unemployment rate

Globalization may not only affect the relative factor rewards but also the unemployment rate. Hence, Table 7.5 presents the pooled OLS regressions of the unemployment rate on the globalization indicators and a set of additional controls. The bivariate correlations point at a positive relationship between the unemployment rate and imports from developing countries as well as trade openness. Surprisingly, net exports of capital are associated with a lower unemployment rate. Trade openness, however, fails to be significant in a joint estimation of all globalization indicators. In contrast to this, the impact of the other globalization indicators remains robust and significant. The further variables indicate that the unemployment rate is higher if the economy faces a recession, lower amounts of capital are available for each worker, labor markets are more regulated and also partly if the labor productivity grows.

Again, the fixed effects estimates presented in Table 7.6 point at the existence of country-specific factors since the estimated globalization effects are not robust. Net capital exports partly lose their significance, whereas trade openness now gains significance in some regressions but the sign of the coefficient depends on the chosen specification. The (except for one case) significant and negative effect of imports from developing countries suggests that trade with (unskilled) labor intensive countries seems to reduce unemployment. Note, however, that from a theoretical perspective, the effect of international trade on the aggregated level of unemployment is not a priori clear (compare hypothesis 3). While jobs are destroyed due to the increasing import-competition, also new jobs are created in export industries. Moreover, trade likely increases the productivity and thus employment in participating countries.

Although I expected an increase in frictional unemployment in the short-run as workers who have been displaced from import-competing industries may not find a new employment immediately (e.g. in the expanding export sectors), earlier studies (e.g. Felbermayr et al., 2011b; Checci and Garcia-Penalosa, 2010) also find evidence for a negative relationship between trade and unemployment.

Table 7.5: Unemployment rate (pooled OLS)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Trade openness$_{(t-1)}$ (log)	0.3887**			0.2986	0.2170	0.2354	-0.2773
	(0.1682)			(0.1872)	(0.2413)	(0.2559)	(0.3592)
Non-OECD imports$_{(t-1)}$ (log)		0.6968***		0.5691**	1.1113***	1.7800***	0.9748**
		(0.1862)		(0.2625)	(0.2584)	(0.3659)	(0.4793)
Net capital exports$_{(t-1)}$			-0.0674***	-0.0709***	-0.0558***	-0.1040***	-0.1112***
			(0.0168)	(0.0193)	(0.0191)	(0.0284)	(0.0282)
Output gap$_{(t-1)}$					-0.3433***	-0.3329***	-0.3380***
					(0.0699)	(0.0709)	(0.0709)
Labor productivity$_{(t-1)}$					0.1338**	0.0864	0.1220*
					(0.0660)	(0.0669)	(0.0705)
Capital per worker$_{(t-1)}$ (log)					-3.9674***	-4.0033***	-4.1364***
					(0.8060)	(0.8322)	(0.8073)
Labor market freedom$_{(t-1)}$						-0.5286***	-0.5653***
						(0.0946)	(0.0970)
Time trend							0.0832**
							(0.0349)
Adj. R-Square	0.0034	0.0079	0.0125	0.0197	0.3162	0.3410	0.3491
Observations	1164	1261	1018	951	430	417	417
Mean VIF				1.04	1.21	1.23	1.66

Notes: OLS regressions. Robust standard errors are reported in parentheses. ***/**/* denotes significance at the 1/5/10%-level.

Table 7.6: Unemployment rate (FEM)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Trade openness$_{(t-1)}$	2.3452***	-0.2845					1.9757***	-1.3377**	0.1182	-1.4542	1.1117*	-0.1146	-1.3049	-0.1146
(log)	(0.2434)	(0.5470)					(0.3722)	(0.6487)	(0.5623)	(1.1319)	(0.5743)	(1.1248)	(1.0433)	(1.1248)
Non-OECD			-1.1189***	-1.9065***			-2.0638***	-2.3933***	-0.9275*	-3.7495***	-0.2408	-3.4516***	-1.6891**	-3.4516***
imports$_{(t-1)}$ (log)			(0.2757)	(0.2794)			(0.3855)	(0.3942)	(0.4751)	(0.6141)	(0.5573)	(0.6434)	(0.6881)	(0.6434)
Net capital					-0.0042	-0.0057	-0.0017	0.0078	-0.0325**	-0.0120	-0.0627***	-0.0434***	-0.0701***	-0.0434***
exports$_{(t-1)}$					(0.0148)	(0.0129)	(0.0189)	(0.0157)	(0.0154)	(0.0142)	(0.0180)	(0.0150)	(0.0184)	(0.0150)
Output gap$_{(t-1)}$									-0.3805***	-0.4205***	-0.4188***	-0.4524***	-0.3834***	-0.4524***
									(0.0496)	(0.0558)	(0.0503)	(0.0517)	(0.0504)	(0.0517)
Labor productivity$_{(t-1)}$									0.0285	0.1312***	0.0190	0.1325***	0.0438	0.1325***
									(0.0435)	(0.0493)	(0.0433)	(0.0468)	(0.0438)	(0.0468)
Capital per									-3.4684***	-3.2695***	-3.0568***	-2.2484*	-3.6281***	-2.2484*
worker$_{(t-1)}$ (log)									(1.0894)	(1.1804)	(1.1209)	(1.1723)	(1.2933)	(1.1723)
Labor market											-0.5863***	-1.0695***	-0.5873***	-1.0695***
freedom$_{(t-1)}$											(0.1665)	(0.1896)	(0.1637)	(0.1896)
Time trend													0.1360***	0.2051***
													(0.0466)	(0.0407)
Year fixed effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R-Square	0.5746	0.7010	0.4535	0.6937	0.5787	0.6871	0.6036	0.7006	0.7767	0.8038	0.7803	0.8166	0.7853	0.8166
Observations	1164	1164	1261	1261	1018	1018	951	951	430	430	417	417	417	417
F-test	89.8739	12.7154	56.5659	20.1106	64.1314	26.4499	68.0999	5.6e+09	56.2341	6.8045	64.3483	6.7455	65.4683	6.8262
p-value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Notes: Fixed effects estimations. Robust standard errors are reported in parentheses. ***/**/* denotes significance at the 1/5/10%-level. The F-tests provide information on the joint significance of country or year fixed effects (if the latter are included).

The influence of the other explanatory variables remains widely unaffected by the choice of the estimators. Overall, a comparison of the pooled OLS and fixed effects estimations points at an interesting pattern in the data. The pooled regressions suggest that more open countries also have higher unemployment rates. One should, however, not infer from this finding that trade increases unemployment. The results of the fixed effects regressions even suggest the opposite. Rather the findings indicate that country-specific factors explain why more open economies also have higher unemployment rates. After controlling for these effects, the results do not support the view that globalization itself is responsible for rising unemployment in industrialized countries.[125] Rather, an economy's ability to cope with the challenges of globalization (e.g. allow declining) seems to matter for the evolution of unemployment.

Determinants of the relative supply of human capital

So far, I have implicitly assumed that the relative factor endowments are not directly affected by globalization. To relax this assumption, the econometric analysis presented in the Tables 7.7 and 7.8 examines a possible relationship between globalization and the relative supply of human capital in the population of OECD countries.

For theoretical reasons, the specifications differ from those employed for the analyses of the relative factor rewards and the unemployment rate. The globalization indicators are now introduced with a lag of five instead of one year. This deviation from my standard specification is reasonable because the relative supply of human capital (measured as the ratio between individuals with tertiary and those with primary education) is a consequence of past education decisions. The global integration of an economy should affect the individual decision to invest into education. Hence, the relative supply of human capital is assumed to depend on past and not current globalization experience.

Table 7.7 presents the findings of the pooled OLS regressions. The bivariate correlations reported in columns (1) to (3) suggest that only imports from developing countries are significantly and positively related to the share of well educated individuals five years later.

[125] The estimated coefficients are equal to the effect of globalization on unemployment rates for an average OECD country but must not apply to a certain country considered in this study. Rather, the impact of international trade and globalization might vary considerably among OECD countries. In particular, domestic institutions could explain different responses to globalization (see section 7.1.2).

Table 7.7: Relative supply of human capital (pooled OLS)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Trade openness$_{(t-5)}$ (log)	0.3448			0.7646*	-3.1291***	-3.4891***	-4.0009***
	(0.2552)			(0.4190)	(0.4628)	(0.4655)	(0.5845)
Non-OECD imports$_{(t-5)}$ (log)		1.3236***		2.9085***	3.9205***	3.2997***	2.6328***
		(0.1923)		(0.5137)	(0.5299)	(0.4511)	(0.5827)
Net capital exports$_{(t-5)}$			0.1572	0.2545*	-0.1582***	-0.0436	-0.0468
			(0.1018)	(0.1457)	(0.0602)	(0.0539)	(0.0531)
Capital per worker$_{(t-5)}$ (log)					5.8296***	6.0858***	5.8814***
					(0.6655)	(0.6409)	(0.6176)
Multifactor productivity$_{(t-5)}$					0.2394*	0.2806**	0.3210**
					(0.1399)	(0.1277)	(0.1324)
Labor market freedom$_{(t-5)}$						0.7579***	0.7372***
						(0.1301)	(0.1271)
Time trend							0.0709
							(0.0570)
Adj. R-Square	0.0001	0.0078	0.0103	0.0342	0.5340	0.6123	0.6135
Observations	1107	1112	950	820	241	236	236
Mean VIF				1.07	1.27	1.29	1.88

Notes: OLS regressions. Robust standard errors are reported in parentheses. ***/**/* denotes significance at the 1/5/10%-level.

Table 7.8: Relative supply of human capital (FEM)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Trade openness$_{(t-5)}$	2.8948***	-8.4361***					1.3693**	-14.0627***	6.7417***	7.4140***	6.8433***	7.6690***	5.1917**	7.6690***
(log)	(0.3364)	(3.1045)					(0.5772)	(4.7580)	(1.4372)	(2.4002)	(1.5372)	(2.4621)	(2.0224)	(2.4621)
Non-OECD			4.3820***	3.0181***			4.7881***	4.0405***	-0.3979	-0.2320	0.0527	0.3957	-0.4501	0.3957
imports$_{(t-5)}$ (log)			(1.1207)	(0.8770)			(1.4275)	(1.4407)	(0.7828)	(1.0132)	(0.8178)	(1.0496)	(0.9899)	(1.0496)
Net capital					0.3066**	0.2632**	0.3955**	0.3832**	-0.1139***	-0.1070***	-0.1179***	-0.1184***	-0.1182***	-0.1184***
exports$_{(t-5)}$					(0.1271)	(0.1197)	(0.1776)	(0.1604)	(0.0420)	(0.0377)	(0.0446)	(0.0398)	(0.0442)	(0.0398)
Capital per									-0.4635	1.8527	-0.4884	1.7296	-0.8336	1.7296
worker$_{(t-5)}$ (log)									(1.0282)	(1.1958)	(1.1509)	(1.2477)	(1.2121)	(1.2477)
Multifactor									0.1279*	0.2149**	0.1099	0.2129**	0.1216	0.2129**
productivity$_{(t-5)}$									(0.0699)	(0.0891)	(0.0758)	(0.0913)	(0.0777)	(0.0913)
Labor market											-0.1923	-0.4630**	-0.2380	-0.4630**
freedom$_{(t-5)}$											(0.1668)	(0.1884)	(0.1613)	(0.1884)
Time trend													0.0834	0.0041
													(0.0784)	(0.1125)
Year fixed effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R-Square	0.1730	0.2102	0.1436	0.1695	0.1967	0.2163	0.2294	0.2601	0.9074	0.9058	0.9072	0.9071	0.9072	0.9071
Observations	1107	1107	1112	1112	950	950	820	820	241	241	236	236	236	236
F-test	63.7456	0.3192	131.8212	1.0160	15.6764	2.8844	22.1767	1.3e+07	82.0319	0.6263	72.4661	0.7491	68.0015	0.7839
p-value	0.0000	1.0000	0.0000	0.4445	0.0000	0.0000	0.0000	0.0000	0.0000	0.8904	0.0000	0.7712	0.0000	0.7245

Notes: Fixed effects estimations. Robust standard errors are reported in parentheses. ***/**/* denotes significance at the 1/5/10%-level. The F-tests provide information on the joint significance of country or year fixed effects (if the latter are included).

The results are partly affected by the inclusion of further explanatory variables: the influence of imports from non-OECD countries remains robust to the inclusion of further explanatory variables. The coefficient of trade openness becomes significantly negative if the amount of capital per worker and the productivity growth are included as further controls (see columns (5) to (7)). The impact of net exports of private capital is not robust. A greater relative capital endowment, multifactor productivity and less regulated labor markets are further associated with a greater relative supply of human capital.

The results of the fixed effects regressions are presented in Table 7.8. As before, the findings are not fully robust to the inclusion of additional variables. After these variables are taken into account, the relationship between globalization and the future relative supply of human capital can be described as follows: a positive link exists between past trade openness and the relative supply of human capital. Imports from non-OECD countries are no longer significant, whereas net exports of capital are significantly negatively related with the share of well educated persons. Among the additional variables, productivity shocks and less flexible labor markets tend to be associated with a higher share of well educated persons.

Determinants of the relative income of unemployed individuals

The transmission variables analyzed above either directly reflect market outcomes or are based on individual decisions in response to changing market conditions. In the following, I focus on an indicator of welfare state size that depends also on domestic policies. The determinants of the relative income of unemployed persons (compared to workers) are analyzed in Table 7.9. The bivariate correlations based on OLS regressions suggest that international trade is negatively related with the relative income of the unemployed, whereas net exports of capital do not have a significant effect. The impact of the share of imports from developing countries is mostly unaffected by the inclusion of additional variables but trade openness is not fully robust. In particular, the sign (and significance) of the coefficient of trade openness depends on the inclusion of the labor market freedom index and a linear time trend. If a common trend in the evolution of the relative income of unemployed persons is taken into account, then a higher trade openness has a significant and positive effect.

Table 7.9: Relative income of unemployed (pooled OLS)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Trade openness$_{(t-1)}$ (log)	-0.0215***			-0.0301***	-0.0344***	-0.0076	0.0743***	0.0433**
	(0.0060)			(0.0079)	(0.0107)	(0.0111)	(0.0217)	(0.0202)
Non-OECD		-0.0261***		-0.0713***	-0.0936***	-0.1727***	-0.0961***	-0.1265***
imports$_{(t-1)}$ (log)		(0.0086)		(0.0132)	(0.0201)	(0.0190)	(0.0280)	(0.0248)
Net capital exports$_{(t-1)}$			-0.0001	-0.0005	-0.0015	-0.0042***	-0.0068***	-0.0059***
			(0.0006)	(0.0008)	(0.0014)	(0.0015)	(0.0017)	(0.0016)
Left government$_{(t-1)}$					-0.0003*	-0.0004**	-0.0003*	-0.0001
					(0.0002)	(0.0002)	(0.0002)	(0.0002)
Voter turnout$_{(t-1)}$						-0.0032***	-0.0036***	-0.0035***
						(0.0006)	(0.0006)	(0.0005)
Labor market						-0.0195***	-0.0195***	-0.0266***
freedom$_{(t-1)}$						(0.0054)	(0.0051)	(0.0051)
Unemployment rate$_{(t-1)}$								-0.0100***
								(0.0016)
Time trend							-0.0068***	-0.0055***
							(0.0018)	(0.0016)
Adj. R-Square	0.0135	0.0155	0.0026	0.0708	0.0765	0.2292	0.2951	0.3680
Observations	408	394	385	374	321	303	303	303
Mean VIF				1.11	1.22	1.45	2.07	2.05

Notes: OLS regressions. Robust standard errors are reported in parentheses. ***/**/* denotes significance at the 1/5/10%-level.

Surprisingly, a higher share of left wing parties in the government and a higher voter turnout are related with a lower relative income of the unemployed. The same applies to less regulated labor markets. A higher unemployment rate is associated with lower relative incomes of the unemployed, which probably reflects budget constraints. Moreover, the significantly negative time trend indicates that the relative income of the unemployed has declined over time.

Table 7.10 presents the fixed effects estimates. The results are affected by the inclusion of country and year fixed effects. Net exports of private capital have a significant negative impact on the relative income of the unemployed. This finding is in line with the view that the international mobility of capital increases the costs of taxation and thus limits the scope for redistribution and welfare state spending (as stated by hypothesis 5(a)). Imports from developing countries are mostly insignificant, whereas the sign of the coefficient of trade openness depends on the inclusion of year fixed effects or the time trend. If these are not included, trade openness has a significantly negative impact. Otherwise, the coefficients are significantly positive.[126] Consequently, the empirical findings do not support the prediction that globalization leads to a decline in welfare state spending although a net outflow of private capital seems to limit the scope for redistribution. Among the additional control variables less regulated labor markets tend to increase the relative income of the unemployed and the time trend still suggests a decline over time.[127]

[126] The dependence of the effect of trade openness on the inclusion of time specific effects suggests that trends in other variables, which are correlated with trade openness might explain a decline in the relative income of the unemployed.

[127] In contrast to the OLS estimates, the relative income of unemployed individuals is not significantly affected by the unemployment rate.

Table 7.10: Relative income of unemployed (FEM)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Trade openness$_{(t-1)}$ (log)	-0.1018*** (0.0175)	0.1431*** (0.0385)					-0.1173*** (0.0266)	0.1640*** (0.0383)	-0.1712*** (0.0370)	0.2232*** (0.0553)	-0.1577*** (0.0333)	0.2567*** (0.0531)	0.2861*** (0.0658)	0.2567*** (0.0531)	0.2922*** (0.0669)	0.2565*** (0.0538)
Non-OECD imports$_{(t-1)}$ (log)			-0.0694*** (0.0188)	0.0401 (0.0259)			0.0133 (0.0328)	0.0379 (0.0273)	0.0313 (0.0457)	0.0423 (0.0419)	0.0685 (0.0596)	0.0493 (0.0433)	0.1074** (0.0465)	0.0493 (0.0433)	0.1123** (0.0464)	0.0486 (0.0437)
Net capital exports$_{(t-1)}$					-0.0016*** (0.0005)	-0.0023*** (0.0006)	-0.0012** (0.0005)	-0.0024*** (0.0007)	-0.0022*** (0.0006)	-0.0030*** (0.0010)	-0.0034*** (0.0011)	-0.0074*** (0.0014)	-0.0060*** (0.0012)	-0.0074*** (0.0014)	-0.0062*** (0.0013)	-0.0074*** (0.0016)
Left government$_{(t-1)}$									0.0003* (0.0002)	0.0002 (0.0001)	0.0001 (0.0002)	0.0001 (0.0001)	0.0001 (0.0001)	0.0001 (0.0001)	0.0001 (0.0001)	0.0001 (0.0001)
Voter turnout$_{(t-1)}$											0.0025** (0.0010)	0.0009 (0.0010)	0.0011 (0.0009)	0.0009 (0.0010)	0.0010 (0.0010)	0.0009 (0.0011)
Labor market freedom$_{(t-1)}$											-0.0106 (0.0104)	0.0202* (0.0116)	0.0215** (0.0087)	0.0202* (0.0116)	0.0221** (0.0089)	0.0200 (0.0122)
Unemployment rate$_{(t-1)}$															0.0008 (0.0015)	-0.0001 (0.0018)
Time trend													-0.0184*** (0.0033)	-0.0196*** (0.0046)	-0.0187*** (0.0033)	-0.0195*** (0.0047)
Year fixed effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R-Square	0.5646	0.6814	0.5041	0.6591	0.5119	0.6741	0.5501	0.6792	0.5797	0.6862	0.6179	0.7358	0.7220	0.7358	0.7211	0.7347
Observations	408	408	394	394	385	385	374	374	321	321	303	303	303	303	303	303
F-test	426.2032	2.5525	914.9078	3.1925	3.2e+12	3.7417	541.9283	2.9534	108.6777	2.5997	61.6399	3.1428	74.8101	0.9213	60.4669	0.8997
p-value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.5997	0.0000	0.6342

Notes: Fixed effects estimations. Robust standard errors are reported in parentheses. ***/**/* denotes significance at the 1/5/10%-level. The F-tests provide information on the joint significance of country or year fixed effects (if the latter are included).

7.1.2 Interdependence between globalization and labor market institutions

The discussion in chapter 5 already suggests that the effect of economic integration on labor market outcomes should depend on domestic institutions (such as the degree of labor market regulation). To account for a possible interdependence between globalization and domestic institutions, I interact the globalization indicators with the index of labor market freedom. This procedure offers insights into the extent to which the impact of globalization on the labor income share, wage dispersion, unemployment rate, the relative supply of human capital and the relative income of unemployed individuals varies among countries with flexible versus highly regulated labor markets.

Table 7.11 presents the analysis of the labor income share including interactions between globalization and labor market freedom. The specifications are based on the baseline regressions (see Table 7.1, column (6) and Table 7.2, columns (11) and (12)).[128] The globalization indicators and their interactions with the EFW index are included separately in columns (1) to (9) and jointly in columns (10) to (12).

The findings indicate that the impact of trade openness indeed depends on the extent of labor market regulation. In a country with average labor market institutions (as measured by the variable labor market freedom), a rise in trade openness reduces the labor income share. In the presence of less regulated labor markets, however, the adverse effect of trade openness on the relative rewards of labor is significantly reduced. The direction of the impact of the share of imports from non-OECD countries and its interaction with different labor market institutions on the relative rewards of labor is the same as for trade openness. In several specifications, however, the coefficients do not reach conventional levels of significance. Net exports of capital tend to reduce the labor income share for average levels of labor market regulation, whereby this negative effect is less pronounced in countries with more flexible labor markets. Moreover, the effect of labor market institutions remains robust (compared to the baseline estimates presented in Table 7.1 and 7.2) and suggests that countries with less regulated labor markets have also lower labor income shares (OLS estimates), whereas a deregulation of labor markets tends to increase a country's labor income share (FEM estimates).

[128] The same choice of the specification applies also to the estimations of the other transmission variables.

Table 7.11: Labor income share: interaction globalization and labor market regulation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Trade openness$_{(t-1)}$ (log)	-0.0496***	-0.0756***	-0.0439***	-0.0387***	-0.0806***	-0.0331**	-0.0403***	-0.0755***	-0.0289*	-0.0475***	-0.0711***	-0.0395***
	(0.0060)	(0.0069)	(0.0149)	(0.0037)	(0.0074)	(0.0150)	(0.0038)	(0.0077)	(0.0149)	(0.0059)	(0.0071)	(0.0146)
Non-OECD imports$_{(t-1)}$ (log)	-0.0449***	-0.0303***	-0.0096	-0.0554***	-0.0243***	-0.0018	-0.0422***	-0.0231***	-0.0023	-0.0532***	-0.0289***	-0.0110
	(0.0069)	(0.0076)	(0.0090)	(0.0091)	(0.0077)	(0.0095)	(0.0073)	(0.0073)	(0.0090)	(0.0094)	(0.0070)	(0.0086)
Net capital exports$_{(t-1)}$	-0.0001	-0.0016***	-0.0014***	0.0001	-0.0018***	-0.0015***	-0.0007	-0.0024***	-0.0020***	-0.0003	-0.0020***	-0.0018***
	(0.0006)	(0.0003)	(0.0003)	(0.0006)	(0.0003)	(0.0003)	(0.0007)	(0.0003)	(0.0003)	(0.0007)	(0.0003)	(0.0003)
Labor productivity$_{(t-1)}$	-0.0042*	0.0008	0.0013*	-0.0042*	0.0009	0.0013*	-0.0044**	0.0007	0.0011	-0.0048**	0.0005	0.0010
	(0.0022)	(0.0007)	(0.0007)	(0.0022)	(0.0007)	(0.0007)	(0.0022)	(0.0007)	(0.0008)	(0.0022)	(0.0007)	(0.0007)
Capital per worker$_{(t-1)}$ (log)	0.0212	0.0384***	0.0431***	0.0102	0.0267***	0.0293***	0.0184	0.0280***	0.0307***	0.0152	0.0362***	0.0419***
	(0.0170)	(0.0070)	(0.0071)	(0.0165)	(0.0080)	(0.0077)	(0.0168)	(0.0080)	(0.0079)	(0.0169)	(0.0072)	(0.0071)
Labor market freedom$_{(t-1)}$	-0.0109***	0.0032	0.0079***	-0.0120***	0.0074***	0.0127***	-0.0117***	0.0081***	0.0126***	-0.0133***	0.0017	0.0060**
	(0.0019)	(0.0026)	(0.0027)	(0.0018)	(0.0020)	(0.0027)	(0.0020)	(0.0019)	(0.0027)	(0.0018)	(0.0024)	(0.0028)
Labor market freedom$_{(t-1)}$ ×	0.0081**	0.0138***	0.0141***							0.0084**	0.0131***	0.0134***
Trade openness$_{(t-1)}$	(0.0033)	(0.0028)	(0.0019)							(0.0033)	(0.0028)	(0.0020)
Labor market freedom$_{(t-1)}$ ×				0.0123**	0.0038	0.0028				0.0159***	0.0039*	0.0028
Non-OECD imports$_{(t-1)}$				(0.0048)	(0.0024)	(0.0025)				(0.0051)	(0.0023)	(0.0024)
Labor market freedom$_{(t-1)}$ ×							0.0007	0.0007***	0.0006***	0.0009**	0.0006***	0.0006***
Net capital exports$_{(t-1)}$							(0.0004)	(0.0002)	(0.0002)	(0.0004)	(0.0002)	(0.0002)
Year fixed effects	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes
Country fixed effects	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Adj. R-Square	0.2852	0.9028	0.9131	0.2883	0.8933	0.9031	0.2827	0.8963	0.9057	0.3024	0.9060	0.9153
Observations	485	485	485	485	485	485	485	485	485	485	485	485

Notes: OLS and fixed effects regressions. Robust standard errors are reported in parentheses. ***/**/* denotes significance at the 1/5/10%-level.

The analysis of the determinants of wage dispersion, which considers possible interactions between increasing global integration and domestic labor market institutions is presented in Table 7.12. Although the interaction effects are less robust than for the regressions of the labor income share, the influence of globalization on wage dispersion seems to depend on domestic labor market institutions, too. Trade openness tends to increase the wage differential for countries with an average level of labor market regulation (in the fixed effects estimates). The interaction effect is significantly positive if both country and year fixed are included (though negative for the OLS estimates). Whereas imports from developing countries mostly have no significant impact on relative wages for a country with average labor market institutions, the interaction with the index of labor market freedom suggests that a higher share of these imports raises wage dispersion in particular in less regulated labor markets. Finally, net exports of capital tend to increase wage dispersion in countries with an average degree of labor market regulation but this effect is less pronounced more in flexible labor markets (though again this finding is not fully robust toward the choice of the estimator).

The effects of globalization on the unemployment rate in the presence of different labor market institutions are reported in Table 7.13. The interaction between trade openness and labor market regulation mostly fails to be significantly different from zero. In contrast to the theoretical predictions, openness tends to increase unemployment, in particular, if labor markets are less regulated.[129] Once country fixed effects are included, the interaction effect becomes insignificant. The interaction effects between labor market regulation and imports from developing countries have the expected negative sign. Moreover, the results again confirm a negative relationship between imports from developing countries and the unemployment rate at an average level of labor market regulation. Surprisingly, net exports of capital seem to reduce the unemployment rate for an average level of labor market regulation and this negative effect is even stronger in less regulated labor markets.

In sum, the findings deliver weak support for the conventional wisdom that trade with developing countries raises the wage dispersion in countries with flexible labor markets (e.g. the U.S. or UK), whereas in the presence of labor market rigidities (e.g. in Continental Europe) the unemployment rates increase. Given the missing robustness, the estimated effect is, however, not as strong as often assumed.

[129] The effect of labor market regulation likely depends on the concrete type of institution under consideration. A strict employment protection might indeed prevent a short-term increase in unemployment induced by globalization. This issue will be addressed in more detail in section 7.1.3.

Table 7.12: Wage dispersion: interaction globalization and labor market regulation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Trade openness$_{(t-1)}$ (log)	-0.0829	0.3780***	0.2042	-0.2181***	0.4017***	0.4123***	-0.2321***	0.3232***	0.1833	-0.0671	0.3769***	0.2154
	(0.0597)	(0.0694)	(0.1291)	(0.0407)	(0.0660)	(0.1229)	(0.0412)	(0.0781)	(0.1163)	(0.0647)	(0.0702)	(0.1423)
Non-OECD imports$_{(t-1)}$ (log)	0.0220	0.0245	0.2307*	0.0060	-0.0549	0.2042	0.0522	0.0442	0.3563**	-0.0263	-0.0839	0.1751
	(0.1076)	(0.0714)	(0.1332)	(0.1141)	(0.0784)	(0.1277)	(0.1147)	(0.0694)	(0.1405)	(0.1168)	(0.0793)	(0.1337)
Net capital exports$_{(t-1)}$	-0.0373***	0.0025	0.0027	-0.0335***	0.0047*	0.0044*	-0.0330***	0.0056**	0.0075***	-0.0376***	0.0077***	0.0100***
	(0.0048)	(0.0027)	(0.0024)	(0.0052)	(0.0026)	(0.0026)	(0.0055)	(0.0027)	(0.0027)	(0.0055)	(0.0029)	(0.0029)
Capital per worker$_{(t-1)}$ (log)	-0.1682	0.1831*	0.3334***	-0.1420	0.0788	0.1602	-0.1300	0.1219	0.1784	-0.1818	0.1417	0.2887**
	(0.1542)	(0.1098)	(0.1272)	(0.1522)	(0.1016)	(0.1131)	(0.1514)	(0.1097)	(0.1210)	(0.1550)	(0.1035)	(0.1177)
Labor market freedom$_{(t-1)}$	0.1697***	0.0296	0.0120	0.1513***	0.0017	0.0041	0.1666***	0.0468**	0.0592**	0.1556***	-0.0065	-0.0086
	(0.0174)	(0.0245)	(0.0260)	(0.0167)	(0.0203)	(0.0250)	(0.0193)	(0.0193)	(0.0243)	(0.0207)	(0.0229)	(0.0267)
Labor market freedom$_{(t-1)}$ ×	-0.1130***	0.0425	0.0736**							-0.1149***	0.0492	0.0799***
Trade openness$_{(t-1)}$	(0.0325)	(0.0327)	(0.0298)							(0.0348)	(0.0299)	(0.0274)
Labor market freedom$_{(t-1)}$ ×				0.0682	0.1338***	0.1248***				0.0662	0.1288***	0.1064***
Non-OECD imports$_{(t-1)}$				(0.0532)	(0.0209)	(0.0229)				(0.0542)	(0.0224)	(0.0254)
Labor market freedom$_{(t-1)}$ ×							-0.0023	-0.0042***	-0.0061***	0.0020	-0.0017	-0.0040**
Net capital exports$_{(t-1)}$							(0.0031)	(0.0015)	(0.0017)	(0.0033)	(0.0015)	(0.0017)
Year fixed effects	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes
Country fixed effects	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Adj. R-Square	0.4556	0.9364	0.9409	0.4419	0.9435	0.9460	0.4399	0.9371	0.9420	0.4546	0.9444	0.9492
Observations	338	338	338	338	338	338	338	338	338	338	338	338

Notes: OLS and fixed effects regressions. Robust standard errors are reported in parentheses. ***/**/* denotes significance at the 1/5/10%-level.

Table 7.13: Unemployment rate: interaction globalization and labor market regulation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Trade openness$_{(t-1)}$ (log)	-0.9615**	1.1144*	-0.1556	-0.1151	0.9939*	-0.3874	0.2445	0.7916	-0.2484	-0.8999**	0.5650	-0.7040
	(0.4035)	(0.5751)	(1.1432)	(0.2618)	(0.5869)	(1.1685)	(0.2520)	(0.6092)	(1.1213)	(0.4090)	(0.6451)	(1.1987)
Non-OECD imports$_{(t-1)}$ (log)	1.8644***	-0.2424	-3.4619***	2.5836***	-0.2074	-3.4082***	2.1318***	-0.2491	-3.3895***	2.6661***	-0.2063	-3.3329***
	(0.3603)	(0.5565)	(0.6454)	(0.3136)	(0.5473)	(0.6195)	(0.3943)	(0.5622)	(0.6417)	(0.3399)	(0.5532)	(0.6158)
Net capital exports$_{(t-1)}$	-0.0955***	-0.0629***	-0.0432***	-0.1484***	-0.0723***	-0.0522***	-0.1532***	-0.0442**	-0.0332*	-0.1543***	-0.0506**	-0.0385**
	(0.0286)	(0.0182)	(0.0150)	(0.0308)	(0.0188)	(0.0161)	(0.0321)	(0.0196)	(0.0181)	(0.0341)	(0.0200)	(0.0187)
Output gap$_{(t-1)}$	-0.3433***	-0.4186***	-0.4530***	-0.3414***	-0.4141***	-0.4424***	-0.3498***	-0.4137***	-0.4475***	-0.3536***	-0.4076***	-0.4350***
	(0.0693)	(0.0509)	(0.0520)	(0.0681)	(0.0499)	(0.0509)	(0.0703)	(0.0506)	(0.0522)	(0.0671)	(0.0507)	(0.0520)
Labor productivity$_{(t-1)}$	0.0803	0.0193	0.1320***	0.1058	0.0198	0.1358***	0.0556	0.0294	0.1372***	0.0882	0.0320	0.1420***
	(0.0663)	(0.0432)	(0.0469)	(0.0689)	(0.0425)	(0.0467)	(0.0647)	(0.0439)	(0.0475)	(0.0666)	(0.0432)	(0.0476)
Capital per worker$_{(t-1)}$ (log)	-3.6175***	-3.0636***	-2.2380*	-2.9543***	-2.9450***	-2.2409*	-3.6972***	-3.0595***	-2.2774**	-2.7093***	-2.9054***	-2.2603**
	(0.8209)	(1.1508)	(1.1776)	(0.8152)	(1.1018)	(1.1687)	(0.8250)	(1.1025)	(1.1548)	(0.8025)	(1.0980)	(1.1450)
Labor market freedom$_{(t-1)}$	-0.6346***	-0.5802***	-1.0857***	-0.2583***	-0.4409**	-0.9402***	-0.5920***	-0.5532***	-1.0346***	-0.3884***	-0.3923**	-0.9018***
	(0.0900)	(0.1923)	(0.2080)	(0.0784)	(0.1725)	(0.1858)	(0.0976)	(0.1688)	(0.1971)	(0.0825)	(0.1945)	(0.2103)
Labor market freedom$_{(t-1)}$ ×	0.9329***	-0.0127	0.0320							0.6485***	0.0408	0.0636
Trade openness$_{(t-1)}$	(0.2078)	(0.1753)	(0.1563)							(0.2306)	(0.1801)	(0.1602)
Labor market freedom$_{(t-1)}$ ×				-1.6542***	-0.3919**	-0.3347**				-1.4470***	-0.4649***	-0.3879***
Non-OECD imports$_{(t-1)}$				(0.2074)	(0.1601)	(0.1315)				(0.2145)	(0.1753)	(0.1396)
Labor market freedom$_{(t-1)}$ ×							0.0689***	-0.0236**	-0.0126	0.0244	-0.0294***	-0.0181*
Net capital exports$_{(t-1)}$							(0.0157)	(0.0100)	(0.0093)	(0.0188)	(0.0111)	(0.0101)
Year fixed effects	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes
Country fixed effects	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Adj. R-Square	0.3724	0.7797	0.8162	0.4282	0.7828	0.8184	0.3644	0.7819	0.8168	0.4461	0.7850	0.8187
Observations	417	417	417	417	417	417	417	417	417	417	417	417

Notes: OLS and fixed effects regressions. Robust standard errors are reported in parentheses. ***/**/* denotes significance at the 1/5/10%-level.

Table 7.14 presents the analysis of the relative supply of human capital in the light of institutional differences. The findings suggest that the influence of globalization depends on the extent to which domestic labor markets are regulated. In the fixed effects model, trade openness is associated with an increase of the relative supply of well educated workers five years later but the interaction effect is insignificant.[130] Rising import-competition from developing countries also seems to increase the relative supply of human capital for countries with less regulated labor markets. Moreover, net exports of capital tend to be negatively associated with the relative supply of human capital for an average level of labor market regulation and also seem to reduce the share of well educated persons if labor markets are more flexible. This effect does, however, not persist once all interaction effects are jointly included.

Finally, Table 7.15 reports the results for the relative income of the unemployed. The empirical findings do not point at a robust effect of trade openness. The interaction effect between trade openness and labor market regulation is negative indicating that international trade reduces the income of unemployed individuals relative to workers more in less regulated labor markets. With regard to imports from non-OECD countries, the results suggest that the relative income of the unemployed tends to increase in the share of imports from non-OECD countries only if labor markets are more flexible. This may reflect a compensation for a greater unemployment risk due to rising import-competition. Net capital exports reduce the relative income of unemployed persons in a country with average labor market institutions and the negative effect is even stronger if labor markets are more flexible.[131]

[130] The OLS estimates suggest that the relative supply of human capital is lower in countries that were more open to international trade five years ago and that this effect is even more pronounced in less regulated labor markets. The F-test (not reported in Table 7.14) supports the joint-significance of the country dummy variables and thus indicates that the fixed effects regressions are more appropriate.

[131] In principle, this might be caused by a common factor such as right-wing governments that pursue policies that both enhance the overall flexibility of labor markets and reduce the scope of the welfare state. This effect should, however, be captured by the variable LEFT GOVERNMENT.

Table 7.14: Relative supply of human capital: interaction globalization and labor market regulation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Trade openness$_{(t-5)}$ (log)	-1.3311***	6.8964***	7.7123***	-3.3290***	7.2112***	10.4555***	-3.1955***	6.3206***	6.4191***	-1.4858***	7.2355***	10.5850***
	(0.3860)	(1.5755)	(2.4953)	(0.4594)	(1.4656)	(2.7149)	(0.5108)	(1.4781)	(2.4566)	(0.3445)	(1.4845)	(2.8475)
Non-OECD imports$_{(t-5)}$ (log)	2.8613***	-0.0359	0.3293	2.0367***	-1.0225	0.0645	2.5332***	0.3061	0.6841	2.3183***	-1.1826	-0.1563
	(0.4024)	(0.8311)	(1.0026)	(0.4569)	(0.7966)	(0.9040)	(0.4377)	(0.7829)	(0.9739)	(0.4185)	(0.8424)	(0.8721)
Net capital exports$_{(t-5)}$	-0.0555	-0.1172***	-0.1183***	0.0171	-0.0586*	-0.0563*	0.0061	-0.0920**	-0.0873**	-0.0223	-0.0526	-0.0541*
	(0.0490)	(0.0444)	(0.0399)	(0.0515)	(0.0354)	(0.0331)	(0.0514)	(0.0423)	(0.0356)	(0.0460)	(0.0335)	(0.0308)
Capital per worker$_{(t-5)}$ (log)	5.1798***	-0.4544	1.7383	5.4071***	-1.4329	1.1477	5.7057***	-0.6340	1.2825	4.9809***	-1.3540	1.1550
	(0.5250)	(1.1247)	(1.2413)	(0.6382)	(1.1729)	(1.1797)	(0.6264)	(1.1725)	(1.2850)	(0.5544)	(1.1490)	(1.1964)
Multifactor productivity$_{(t-5)}$	0.2585**	0.1089	0.2130**	0.2362*	0.0773	0.1409	0.3130**	0.1186	0.2145**	0.2538**	0.0771	0.1405
	(0.1075)	(0.0771)	(0.0919)	(0.1208)	(0.0705)	(0.0856)	(0.1211)	(0.0756)	(0.0878)	(0.1070)	(0.0722)	(0.0884)
Labor market freedom$_{(t-5)}$	0.8188***	-0.2157	-0.4818**	0.6769***	-0.3277**	-0.4175**	0.8884***	-0.1529	-0.3402*	0.8137***	-0.3786**	-0.4771**
	(0.1181)	(0.2086)	(0.2273)	(0.1247)	(0.1411)	(0.1728)	(0.1305)	(0.1598)	(0.1952)	(0.1124)	(0.1696)	(0.1947)
Labor market regulation$_{(t-5)}$ ×	-1.9927***	0.0988	0.0599							-1.7383***	0.2616	0.2062
Trade openness$_{(t-5)}$	(0.2238)	(0.2842)	(0.2736)							(0.2646)	(0.2490)	(0.2423)
Labor market regulation$_{(t-5)}$ ×				1.4637***	1.2701***	1.2616***				0.4911*	1.2444***	1.2743***
Non-OECD imports$_{(t-5)}$				(0.3325)	(0.2543)	(0.2611)				(0.2962)	(0.2685)	(0.2928)
Labor market regulation$_{(t-5)}$ ×							-0.1422***	-0.0402**	-0.0424**	-0.0325	-0.0084	-0.0016
Net capital exports$_{(t-5)}$							(0.0320)	(0.0198)	(0.0205)	(0.0311)	(0.0206)	(0.0223)
Year fixed effects	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes
Country fixed effects	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Adj. R-Square	0.7103	0.9068	0.9066	0.6406	0.9189	0.9179	0.6480	0.9090	0.9090	0.7137	0.9186	0.9173
Observations	236	236	236	236	236	236	236	236	236	236	236	236

Notes: OLS and fixed effects regressions. Robust standard errors are reported in parentheses. ***/**/* denotes significance at the 1/5/10%-level.

Table 7.15: Relative income unemployed: interaction globalization and labor market regulation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Trade openness$_{(t-1)}$ (log)	0.0280**	-0.1818***	0.2533***	-0.0028	-0.1583***	0.2726***	-0.0093	-0.1712***	0.2364***	0.0261**	-0.1963***	0.2462***
	(0.0128)	(0.0400)	(0.0612)	(0.0115)	(0.0335)	(0.0544)	(0.0113)	(0.0368)	(0.0532)	(0.0130)	(0.0428)	(0.0639)
Non-OECD imports$_{(t-1)}$ (log)	-0.1932***	0.0807	0.0501	-0.2022***	0.0669	0.0426	-0.1832***	0.0766	0.0632	-0.2093***	0.0875	0.0545
	(0.0177)	(0.0609)	(0.0451)	(0.0182)	(0.0589)	(0.0413)	(0.0197)	(0.0614)	(0.0434)	(0.0172)	(0.0612)	(0.0433)
Net capital exports$_{(t-1)}$	-0.0047***	-0.0041***	-0.0075***	-0.0026*	-0.0031***	-0.0067***	-0.0040***	-0.0028***	-0.0068***	-0.0034**	-0.0033***	-0.0066***
	(0.0015)	(0.0011)	(0.0015)	(0.0015)	(0.0011)	(0.0013)	(0.0015)	(0.0011)	(0.0014)	(0.0015)	(0.0011)	(0.0014)
Left government$_{(t-1)}$	-0.0003	0.0001	0.0001	-0.0004**	0.0001	0.0000	-0.0004**	0.0001	0.0000	-0.0003**	0.0001	0.0000
	(0.0002)	(0.0001)	(0.0001)	(0.0002)	(0.0002)	(0.0001)	(0.0002)	(0.0002)	(0.0001)	(0.0002)	(0.0002)	(0.0001)
Voter turnout$_{(t-1)}$	-0.0024***	0.0021**	0.0009	-0.0022***	0.0026**	0.0012	-0.0029***	0.0024**	0.0009	-0.0019***	0.0021**	0.0011
	(0.0006)	(0.0010)	(0.0011)	(0.0006)	(0.0010)	(0.0010)	(0.0006)	(0.0010)	(0.0010)	(0.0006)	(0.0010)	(0.0010)
Labor market freedom$_{(t-1)}$	-0.0189***	-0.0044	0.0205*	-0.0227***	-0.0134	0.0126	-0.0175***	-0.0109	0.0197*	-0.0226***	-0.0068	0.0146
	(0.0052)	(0.0102)	(0.0123)	(0.0054)	(0.0114)	(0.0117)	(0.0054)	(0.0104)	(0.0115)	(0.0053)	(0.0111)	(0.0122)
Labor market freedom$_{(t-1)}$ ×	-0.0428***	-0.0283**	-0.0015							-0.0348***	-0.0308**	-0.0054
Trade openness$_{(t-1)}$	(0.0066)	(0.0143)	(0.0126)							(0.0072)	(0.0153)	(0.0126)
Labor market freedom$_{(t-1)}$ ×				0.0585***	0.0115	0.0293***				0.0488***	0.0110	0.0249**
Non-OECD imports$_{(t-1)}$				(0.0084)	(0.0105)	(0.0095)				(0.0096)	(0.0112)	(0.0103)
Labor market regulation$_{(t-1)}$ ×							-0.0019***	-0.0013**	-0.0015***	0.0009	-0.0012**	-0.0009*
Net capital exports$_{(t-1)}$							(0.0007)	(0.0006)	(0.0005)	(0.0007)	(0.0005)	(0.0005)
Year fixed effects	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes
Country fixed effects	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Adj. R-Square	0.2999	0.6254	0.7347	0.2926	0.6178	0.7437	0.2388	0.6206	0.7401	0.3313	0.6283	0.7435
Observations	303	303	303	303	303	303	303	303	303	303	303	303

Notes: OLS and fixed effects regressions. Robust standard errors are reported in parentheses. ***/**/* denotes significance at the 1/5/10%-level.

7.1.3 Robustness checks

To check the robustness of my results, I run a battery of regressions using different specifications, samples and estimators. In addition, I address several alternative explanations for the observable changes in the transmission mechanisms. In particular, I employ different measures of capital mobility, test the relevance of technological change as a competing explanation for changes in labor market outcomes, focus on the role of specific labor market institutions and provide a more detailed analysis of the determinants of the relative supply of human capital. Moreover, I conduct seemingly unrelated regressions to take a potential simultaneity bias into account and vary the length of the time lags. Finally, the sensitivity of the results toward the exclusion of certain countries and periods is tested. The additional variables included in the regressions of this section are described in Table A.1.

Alternative measurement of capital mobility

The following analysis tests the robustness of the findings by using different measures for the degree of financial openness. Instead of employing net exports of capital (i.e. the difference between outflows and inflows of private capital as a percentage of GDP) as an indicator of international capital mobility, I use gross capital movements (i.e. the sum of in- and outflows of private capital as a percent of GDP) in Table 7.16 and net exports of FDI (in percent of GDP) in Table 7.17.

Gross capital movements indicate to what extent a country is open to international capital flows irrespectively of their direction. The overall amount of capital flows may also be a better proxy for the degree of capital mobility and thus the ease at which capital can leave a country.[132] Table 7.16 indicates that the effect of gross capital movements on the transmission variables are partly different from that of net exports of capital. The labor income share is significantly negatively related to both gross capital movements and net exports of capital. Wage dispersion and the unemployment rate are not significantly associated with gross capital movements.[133] Both the relative supply of human capital and the relative income of unemployed persons tend to decrease with increasing capital flows. The negative effect of gross capital movements is, however, only significant if year fixed effects are not included. Both transmission variables are also negatively related with net exports of private

[132] Note that for the threat effect of capital exit no actual movements are necessary. To constrain the bargaining power of labor, the mere possibility of a capital outflow would be sufficient.

[133] In contrast to this, net exports of capital tend to have a significantly negative effect on the unemployment rate.

capital. Thus, the analysis indicates that a higher mobility of capital (irrespective of its direction) seems to reduce the disposable income of unemployed individuals relative to workers. The remaining variables are widely unaffected by the choice of this alternative measure of capital mobility.

Most empirical studies that elaborate on the impact of financial globalization on labor market outcomes, government redistribution or income inequality focus on FDI to measure capital mobility. Although this confinement seems adequate for an analysis involving multinational firms (e.g. tax issues, firm organization, technology transfers or productivity), it is not a priori clear why studies on capital mobility focusing on the country-level should be based only on one specific source of private capital and exclude portfolio or other investments.[134]

Nevertheless, to enhance the comparability of the results with those of earlier studies and to test whether these are affected by focusing merely on FDI, Table 7.17 presents the baseline regressions using net exports of FDI instead of net exports of private capital. In general, net FDI exports are not significantly related to the examined transmission variables.

Given the difference of the results based on FDI versus general private capital flows (including FDI, portfolio and other investments), a mere focus on one kind of investment might be highly misleading. Insignificant results for FDI measures should, moreover, not be interpreted as evidence for the absence of any effects of financial globalization. At least broader indicators should be employed to check the validity of such a conclusion.

[134] This issue has been already discussed in chapter 5.

Table 7.16: Measurement of capital mobility: gross capital movements

	Labor income share		Wage dispersion		Unemployment rate		Relative supply human capital		Relative income unemployed	
Trade openness$_{(t-1)}$ (log)	-0.0510***	-0.0162	0.4033***	0.2884**	1.5551**	0.3010			-0.0896***	0.2206***
	(0.0090)	(0.0151)	(0.0767)	(0.1198)	(0.6422)	(1.1273)			(0.0287)	(0.0616)
Trade openness$_{(t-5)}$ (log)							6.8048***	7.5099***		
							(1.5878)	(2.6685)		
Non-OECD imports$_{(t-1)}$ (log)	-0.0345***	-0.0133	0.0531	0.2983**	-0.4500	-3.6111***			0.0662	0.0404
	(0.0084)	(0.0100)	(0.0722)	(0.1360)	(0.5553)	(0.6505)			(0.0568)	(0.0441)
Non-OECD imports$_{(t-5)}$ (log)							-0.1135	0.3044		
							(0.8256)	(1.0900)		
Gross capital movements$_{(t-1)}$ (log)	-0.0139***	-0.0094***	-0.0145	-0.0110	-0.2208	0.0301			-0.0294**	-0.0099
	(0.0027)	(0.0027)	(0.0222)	(0.0279)	(0.1919)	(0.2117)			(0.0126)	(0.0115)
Gross capital movements$_{(t-5)}$ (log)							-0.4506*	-0.2767		
							(0.2380)	(0.2911)		
Labor productivity$_{(t-1)}$	0.0006	0.0011			0.0059	0.1295***				
	(0.0006)	(0.0007)			(0.0437)	(0.0470)				
Capital per worker$_{(t-1)}$ (log)	0.0341***	0.0303***	0.1261	0.1998	-3.2341***	-2.3264**				
	(0.0073)	(0.0074)	(0.1104)	(0.1251)	(1.1166)	(1.1422)				
Capital per worker$_{(t-5)}$ (log)							1.1570	3.1554**		
							(1.0506)	(1.3281)		
Labor market freedom$_{(t-1)}$	0.0101***	0.0153***	0.0390**	0.0397*	-0.5319***	-1.0328***			-0.0101	0.0229*
	(0.0020)	(0.0026)	(0.0194)	(0.0236)	(0.1668)	(0.1912)			(0.0107)	(0.0124)
Labor market freedom$_{(t-5)}$							-0.1531	-0.3161		
							(0.1743)	(0.2157)		
Output gap$_{(t-1)}$					-0.3875***	-0.4383***				
					(0.0498)	(0.0524)				
Multifactor productivity$_{(t-5)}$							0.0887	0.1624*		
							(0.0736)	(0.0877)		
Left government$_{(t-1)}$									0.0001	0.0000
									(0.0002)	(0.0001)
Voter turnout$_{(t-1)}$									0.0027**	0.0015
									(0.0011)	(0.0011)
Year fixed effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R-Square	0.8889	0.8978	0.9358	0.9388	0.7746	0.8137	0.9040	0.9028	0.6214	0.7073
Observations	485	485	338	338	417	417	236	236	303	303

Notes: Fixed effects estimations. Based on the baseline specifications of the fixed effects estimations reported in columns (11) and (12) of Table 7.2 to 7.10. Robust standard errors are reported in parentheses. ***/**/* denotes significance at the 1/5/10%-level.

Table 7.17: Measurement of capital mobility: net exports of FDI capital

	Labor income share		Wage dispersion		Unemployment rate		Relative supply human capital		Relative income unemployed	
Trade openness$_{(t-1)}$ (log)	-0.0773***	-0.0151	0.3744***	0.2888**	1.1861**	0.3015			-0.1559***	0.2115***
	(0.0079)	(0.0153)	(0.0729)	(0.1206)	(0.5892)	(1.1390)			(0.0334)	(0.0580)
Trade openness$_{(t-5)}$ (log)							6.0449***	6.8588***		
							(1.4006)	(2.4154)		
Non-OECD imports$_{(t-1)}$ (log)	-0.0353***	-0.0070	0.0568	0.3121**	-0.5325	-3.6475***			0.0679	0.0454
	(0.0087)	(0.0101)	(0.0723)	(0.1332)	(0.5330)	(0.6451)			(0.0600)	(0.0456)
Non-OECD imports$_{(t-5)}$ (log)							-0.0750	0.3098		
							(0.8062)	(1.1044)		
Net FDI exports$_{(t-1)}$	0.0002	0.0003	0.0007	0.0021	0.0236	-0.0101			0.0005	0.0001
	(0.0004)	(0.0004)	(0.0029)	(0.0033)	(0.0249)	(0.0169)			(0.0008)	(0.0008)
Net FDI exports$_{(t-5)}$							-0.0143	-0.0067		
							(0.0198)	(0.0208)		
Labor productivity$_{(t-1)}$	0.0009	0.0012*			0.0106	0.1291***				
	(0.0007)	(0.0007)			(0.0442)	(0.0476)				
Capital per worker$_{(t-1)}$ (log)	0.0293***	0.0305***	0.1230	0.2017	-3.3649***	-2.3114**				
	(0.0073)	(0.0074)	(0.1099)	(0.1254)	(1.1259)	(1.1434)				
Capital per worker$_{(t-5)}$ (log)							0.7295	3.0382**		
							(1.0439)	(1.3174)		
Labor market freedom$_{(t-1)}$	0.0113***	0.0154***	0.0384**	0.0381	-0.5123***	-1.0287***			-0.0078	0.0239*
	(0.0021)	(0.0027)	(0.0193)	(0.0231)	(0.1605)	(0.1874)			(0.0106)	(0.0123)
Labor market freedom$_{(t-5)}$							-0.1363	-0.3642*		
							(0.1735)	(0.2031)		
Output gap$_{(t-1)}$					-0.3940***	-0.4383***				
					(0.0509)	(0.0526)				
Multifactor productivity$_{(t-5)}$							0.0772	0.1608*		
							(0.0727)	(0.0872)		
Left government$_{(t-1)}$									0.0001	0.0000
									(0.0002)	(0.0001)
Voter turnout$_{(t-1)}$									0.0027**	0.0014
									(0.0011)	(0.0011)
Year fixed effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R-Square	0.8817	0.8955	0.9357	0.9389	0.7744	0.8138	0.9026	0.9024	0.6109	0.7063
Observations	485	485	338	338	417	417	236	236	303	303

Notes: Fixed effects estimations. Based on the baseline specifications of the fixed effects estimations reported in columns (11) and (12) of Table 7.2 to 7.10. Robust standard errors are reported in parentheses. ***/**/* denotes significance at the 1/5/10%-level.

The role of technological change

There is a widespread agreement among economists that shifts in the relative demand for skilled versus unskilled labor are responsible for growing wage inequality or unemployment in many industrialized countries. No consensus exists, however, on the underlying forces. In general, two explanations compete: international trade and skill-biased technological change. Due to reasons discussed in chapter 5, many economists have focused on the role of technological change. To check the robustness of the baseline results concerning the role of globalization, I control for several measures of technological change. The results are presented in Table 7.18.[135] The labor income share decreases if the share of information and communication technology (ICT) investments grows, whereas the wage dispersions is not significantly and robustly related to any of the proxies of technological change. Only R&D expenditures are significantly negatively associated with the wage differential if year fixed effects are not included. The unemployment rate is affected by technological improvements: whereas the growth of investments in ICT in relation to total capital input is negatively correlated with the unemployment rate (if year fixed effects are not included), both higher R&D expenditures and employment increase the unemployment rate. Surprisingly, the relative supply of highly educated individuals is significantly negatively related with ICT investments.

Despite the inclusion of proxies for technological change, globalization mostly remains significantly related to the transmission mechanisms. Thus, the view of several economists that not international trade but predominantly technological change is responsible for developments such as rising wage dispersion cannot be confirmed.

[135] Technological change is expected to affect the relative labor demand and the consequences for labor market outcomes are, hence, comparable to those of globalization. The effect on the welfare state is, however, less clear since technological change should not affect its financing like, for instance, international tax competition. Consequently, I do not analyze the relative income of the unemployed in this context.

Table 7.18: Technological change versus globalization

	Labor income share						Wage dispersion					
	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)
Trade openness$_{(t-1)}$ (log)	-0.0764***	-0.0158	-0.0722***	-0.0356*	-0.0783***	-0.0276	0.2301**	0.6271***	0.0625	0.0929	0.2848***	0.3383**
	(0.0116)	(0.0217)	(0.0116)	(0.0188)	(0.0098)	(0.0170)	(0.1051)	(0.1559)	(0.0812)	(0.1673)	(0.0813)	(0.1510)
Non-OECD imports$_{(t-1)}$ (log)	-0.0043	0.0220	-0.0193*	-0.0034	-0.0171	0.0086	0.1401*	0.3326**	0.2472***	0.4625***	0.1428**	0.2861**
	(0.0099)	(0.0134)	(0.0114)	(0.0134)	(0.0104)	(0.0119)	(0.0774)	(0.1369)	(0.0700)	(0.1701)	(0.0644)	(0.1417)
Net capital exports$_{(t-1)}$	-0.0023***	-0.0024***	-0.0015***	-0.0012***	-0.0016***	-0.0013***	-0.0050*	-0.0071**	0.0043*	0.0038	0.0027	0.0022
	(0.0004)	(0.0004)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0029)	(0.0036)	(0.0024)	(0.0027)	(0.0022)	(0.0024)
Labor productivity$_{(t-1)}$	0.0002	0.0006	0.0005	0.0010	0.0009	0.0014*	-0.0006	0.0023	-0.0060	-0.0102	-0.0036	-0.0019
	(0.0010)	(0.0010)	(0.0007)	(0.0008)	(0.0008)	(0.0008)	(0.0048)	(0.0059)	(0.0045)	(0.0064)	(0.0046)	(0.0060)
Capital per worker$_{(t-1)}$ (log)	0.0149	0.0388**	0.0279***	0.0349***	0.0280***	0.0377***	-0.0563	-0.0562	-0.1200	-0.2527	-0.0077	0.0199
	(0.0157)	(0.0193)	(0.0089)	(0.0091)	(0.0092)	(0.0090)	(0.1345)	(0.1599)	(0.1102)	(0.1585)	(0.1068)	(0.1507)
Labor market freedom$_{(t-1)}$	0.0042*	0.0106***	0.0084***	0.0121***	0.0080***	0.0131***	0.0368**	0.0508**	0.0289	0.0284	0.0278	0.0164
	(0.0023)	(0.0028)	(0.0024)	(0.0030)	(0.0023)	(0.0031)	(0.0150)	(0.0200)	(0.0208)	(0.0251)	(0.0180)	(0.0221)
ICT investment$_{(t-1)}$ (log)	-0.0077**	-0.0140**					0.0025	-0.0534				
	(0.0035)	(0.0069)					(0.0390)	(0.0490)				
R&D personnel$_{(t-1)}$ (log)			-0.0121	-0.0051					-0.1204	-0.0418		
			(0.0109)	(0.0114)					(0.1324)	(0.1443)		
R&D expenditures$_{(t-1)}$ (log)					-0.0119	-0.0096					-0.2048*	-0.1991
					(0.0087)	(0.0090)					(0.1067)	(0.1320)
Year fixed effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R-Square	0.9094	0.9217	0.8866	0.8946	0.8854	0.8996	0.9671	0.9663	0.9476	0.9478	0.9579	0.9568
Observations	297	297	358	358	407	407	229	229	253	253	287	287

Continued on next page

Table 7.18 – continued from previous page

	Unemployment rate						Relative supply human capital					
	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)
Trade openness$_{(t-1,t-5)}$ (log)	1.8206**	-1.4698	-0.4699	-0.4394	0.1589	-0.8261	8.3194***	10.2544***	1.8837**	1.4334	7.1296***	8.3242***
	(0.7483)	(1.5324)	(0.7699)	(1.2335)	(0.6697)	(1.2518)	(1.7045)	(2.7564)	(0.7672)	(1.6575)	(1.5838)	(2.7505)
Non-OECD imports$_{(t-1,t-5)}$ (log)	-2.6797***	-5.0349***	-1.5409***	-3.3802***	-0.7357	-3.7311***	-0.2261	0.9174	1.8001***	1.6604**	-0.0001	0.5097
	(0.7022)	(0.6522)	(0.5815)	(0.6482)	(0.5902)	(0.6758)	(0.8568)	(1.0849)	(0.5534)	(0.6494)	(0.9253)	(1.1308)
Net capital exports$_{(t-1,t-5)}$	-0.0359	-0.0142	-0.0680***	-0.0449***	-0.0577***	-0.0407**	-0.1151***	-0.1166***	0.0351	0.0292	-0.1251***	-0.1194***
	(0.0309)	(0.0218)	(0.0188)	(0.0163)	(0.0188)	(0.0158)	(0.0422)	(0.0400)	(0.0216)	(0.0241)	(0.0452)	(0.0426)
Output gap$_{(t-1)}$	-0.4879***	-0.6147***	-0.4304***	-0.4906***	-0.4006***	-0.4479***						
	(0.0625)	(0.0631)	(0.0470)	(0.0500)	(0.0491)	(0.0529)						
Labor productivity$_{(t-1)}$	0.0843	0.1632**	0.0691	0.1401***	0.0453	0.1418***						
	(0.0652)	(0.0636)	(0.0434)	(0.0460)	(0.0440)	(0.0472)						
Capital per worker$_{(t-1,t-5)}$ (log)	0.8414	-0.3695	-2.0785*	-1.3378	-2.8199**	-2.1765*	1.0345	2.6039*	0.7393	0.9140	-0.7286	2.1009
	(1.2431)	(1.2391)	(1.2408)	(1.2508)	(1.2236)	(1.2840)	(1.2467)	(1.3737)	(0.7789)	(0.9979)	(1.2060)	(1.5536)
Labor market freedom$_{(t-1,t-5)}$	-0.5461***	-0.8278***	-0.6233***	-0.8806***	-0.4794***	-0.9285***	-0.3912**	-0.4135**	-0.2654**	-0.4771***	-0.2787	-0.6026***
	(0.1774)	(0.1988)	(0.1820)	(0.2067)	(0.1716)	(0.1965)	(0.1638)	(0.1842)	(0.1309)	(0.1705)	(0.1853)	(0.1977)
Multifactor productivity$_{(t-5)}$							0.1314	0.1996**	-0.0125	0.0475	0.0824	0.1877*
							(0.0826)	(0.0982)	(0.0483)	(0.0590)	(0.0830)	(0.0987)
ICT investment$_{(t-1,t-5)}$ (log)	-1.6016***	0.4112						-1.2118***	-1.0043**			
	(0.3956)	(0.3848)						(0.3425)	(0.4867)			
R&D personnel$_{(t-1,t-5)}$ (log)			4.6337***	4.1029***					-0.1064	-0.1674		
			(0.6687)	(0.7243)					(0.7876)	(0.9943)		
R&D expenditures$_{(t-1,t-5)}$ (log)					2.9394***	2.0571***					0.3480	-0.2191
					(0.6647)	(0.6127)					(0.9745)	(1.0376)
Year fixed effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R-Square	0.8003	0.8420	0.8008	0.8273	0.7852	0.8160	0.9119	0.9086	0.8191	0.8092	0.9055	0.9063
Observations	294	294	344	344	388	388	225	225	186	186	219	219

Notes: Fixed effects estimations. Based on the baseline specifications of the fixed effects estimations reported in columns (11) and (12) of Table 7.2 to 7.10. Robust standard errors are reported in parentheses. ***/**/* denotes significance at the 1/5/10%-level. The explanatory variables are included in the the regressions with a lag of one year for all transmission variables except for the RELATIVE SUPPLY OF HUMAN CAPITAL where a lag of five years is chosen.

Impact of specific labor market institutions

The empirical analysis points at a considerable impact of the overall level of labor market regulation on labor market outcomes. The EFW index of labor market freedom, however, covers a set of different types of labor market institutions. In the following, I conduct a more disaggregated analysis, which offers information on the impact of specific labor market institutions and tests the robustness of the globalization effects with respect to their inclusion. The following aspects of labor markets, which have proven relevant in earlier studies are considered: employment protection legislation, union density and union coverage, coordination of wage bargaining, gross benefit replacement rates, benefit duration, the ratio between legal minimum wages and the median wage and the tax wedge.[136] A joint inclusion of these variables could be problematic since the results are likely affected by multicollinearity in that case. The EFW index as an indicator for the overall design of labor market institutions (i.e. the degree to which labor markets are regulated) is thus preferable to the inclusion of a battery of different indicators. Nonetheless, the substitution of this index by single aspects of labor market policies may enhance the understanding of the specific institutional features, which are important for the examined labor market outcomes.[137]

The empirical analysis of the labor income share is presented in Table A.5.[138] Among the different labor market institutions, a higher share of workers covered by union wages, a higher degree of bargaining coordination and more generous unemployment benefits (i.e. higher gross replacement rates and longer benefit durations) and a greater tax wedge are associated with a significantly lower labor share. Moreover, higher minimum wages tend to reduce the share of income accruing to labor, whereas a higher union density tends to be associated with a higher labor income share. These variables are, however, only partly significant. The globalization indicators remain mostly robust: net capital exports are unaffected by the separate inclusion of different labor market institutions, whereas trade openness gains significance and becomes positive in one case.[139] The influence of imports from developing

[136] The data is from Nickell (2006).

[137] For the assessment of the determinants of labor market outcomes and the relative importance of globalization, the EFW index is a better proxy of the relevant institutional framework. In particular, since the labor market institutions are strongly interrelated. One should keep this in mind, when assessing the results.

[138] To facilitate the readability, this and the other Tables discussed in this section are included in appendix A.2.

[139] If the relative minimum wage is included in combination with year fixed effects, trade openness is positively correlated with the labor income share.

countries, however, is not robust.

Table A.6 illustrates how specific labor market institutions are associated with the wage differential in industrialized countries. Union coverage, bargaining coordination, gross replacement rates and benefit duration, minimum wages and the tax wedge are related to a significantly lower wage dispersion across the different specifications. Moreover, the level of employment protection also reduces the wage differential in the analysis including year fixed effects. The impact of the globalization indicators indeed seems to depend on the inclusion of certain institutions. Trade openness and imports from non-OECD countries become less significant in most cases. Now, net exports of capital have negative coefficients and are significant most specifications.

The results of the analysis concerning the relevance of certain labor market institutions for the unemployment rate are presented in Table A.7. Union coverage, higher gross replacement rates and the tax wedge are significantly positively related with the unemployment rate (even after controlling for year-specific effects). Union density and a more coordinated bargaining process also tend to raise the unemployment rate if year fixed effects are not included. The minimum wage is associated with higher unemployment if year fixed effects are included. Again, the influence of the globalization indicators on the unemployment rate seems to depend on the consideration of the overall degree of labor market regulation. Without this overall indicator, trade openness loses its significance in several cases, whereas the share of imports from developing countries gains significance and remains insignificant only in three cases. The results suggest that especially the influence of trade openness on the unemployment rate depends on the overall design of labor market institutions. The strongest change is observed for net exports of capital, which become completely insignificant and, hence, suggest that the impact of capital outflows on the unemployment rate in industrialized countries depends on the overall institutional framework.

So far, the focus has been on rather immediate effects of labor market institutions and globalization on equilibrium outcomes. Table A.8 offers further insights into the relationship between specific features of labor markets and the supply of well relative to poorly educated persons. The findings indicate that a more generous compensation of the unemployed (both through longer benefit durations and partly also higher gross replacement rates) and higher taxes on labor have a significant negative effect on the relative supply of human capital five years later. A possible explanation for this finding is that generous unemployment transfers improve the

outside option for poorly educated workers who are at risk of being displaced. Thus, for these workers the incentive to invest in education in order to improve their employment perspectives will be reduced. Similarly, a greater tax wedge reduces the wage income, which is available for consumption compared to the wage costs faced by employers. Rising taxation of labor lowers the net income gains from education and therefore also the individual incentives for further educational attainment. Among the remaining labor market institutions, bargaining coordination tends to be positively correlated with the future supply of human capital (though only partly significant). A higher minimum wage is related to a lower relative supply of educated individuals as this increases the relative wages of workers with low educational attainment and therewith reduces the rewards to investments in education. The impact of globalization on the relative supply of human capital is not strongly affected by the focus on specific aspects of labor market institutions instead of the overall index.

Finally, the consequences of different labor market policies for the income of unemployed persons relative to workers are analyzed in Table A.9. The results indicate that employment protection and unemployment compensation tend to be substitutes because a higher protection of existing jobs is associated with significantly lower relative incomes for unemployed persons. More powerful trade unions and the coordination of the bargaining process are positively correlated with the generosity of unemployment compensation. Furthermore, a positive (and without year fixed effects also marginally significant) correlation exists between the minimum wage and the relative income of the unemployed. The impact of trade openness and net exports of private capital is not much affected by the separate inclusion of labor market institutions, whereas the share of non-OECD imports even becomes more significant in most specifications.

Channels through which globalization affects the relative supply of human capital

The theoretical predictions concerning the link between globalization and the relative supply of human capital rest on the assumption that international trade and capital mobility reduce either the relative wage or the employment prospects of less educated workers. Thus, both the dispersion of wages and the unemployment rate (based on the implicit assumption that unemployment disproportionately affects less educated workers) should be positively related with the future relative supply of educated workers. To test this empirically, I have added the decile ratio of the

distribution of gross wages among full-time workers (i.e. the variable WAGE DISPERSION) as well as the unemployment rate to the baseline estimations of the relative supply of human capital (see columns (1) to (3) in Table 7.19). Both variables indeed have a significant positive impact suggesting that rising rewards to education also induce a supply response. The globalization variables, however, remain significant and are not affected substantially by the inclusion of variables capturing the returns to investments into education. Although this finding does not support the presumption that globalization affects the relative supply of educated individuals predominantly via these channels, it does also not necessarily imply that these are not major mechanisms.[140]

I employ an instrumental variable (2SLS) approach as an attempt to relate the globalization-induced change in wage dispersion as well as the unemployment rate to the future stock of individuals with tertiary versus primary education. The wage dispersion and unemployment rate are instrumented using the three globalization indicators. The IV estimates reported in columns (4) to (6) of Table 7.19 also point at a positive and mostly significant impact of wage differences and unemployment on the relative supply of human capital.[141] Moreover, the estimated coefficients are larger than those of the OLS regressions. These results are, however, only suggestive as the globalization indicators may not be valid instruments. Nevertheless, the F-tests of the first-stage regressions exceed the critical value of ten suggesting that the instruments are not particularly weak and the over-identification (Hansen-J) test supports the assumption that the instruments are exogenous.[142]

[140] Despite the existence of alternative channels through which globalization may affect the individual education decision, other factors such as measurement error could also explain the joint significance of globalization variables and the relative wages and unemployment of workers. For instance, the latter do not directly measure the outcomes for different levels of education and do thus not fully capture the relative rewards of well versus poorly educated workers. In particular, the unemployment rate, which is reported for all workers, does not distinguish between different levels of education.

[141] The impact of wage dispersion is significantly different from zero only in specifications including country fixed effects.

[142] If more instruments than instrumented variables are available (i.e. the model is over-identified), the Hansen-J tests the null hypothesis that all instruments are valid (i.e. uncorrelated with the residual). The null cannot be rejected.

Table 7.19: Relative supply of human capital: role of wage dispersion and unemployment

	OLS			IV	First-stage		IV	First-stage		IV	First-stage	
					Wage disp.	Unempl. rate		Wage disp.	Unempl. rate		Wage disp.	Unempl. rate
	(1)	(2)	(3)	(4)			(5)			(6)		
Trade openness$_{(t-5)}$	-2.0707***	7.1653***	9.9951***		-0.5916***	-0.9630**		0.1916**	1.166		0.4451**	0.5397
(log)	(0.6859)	(1.4376)	(2.9832)		(0.1083)	(0.4366)		(0.0928)	(1.0445)		(0.2031)	(2.2121)
Non-OECD	4.0599***	-0.4661	1.6828		-0.1206	0.0464		0.2344***	-4.1998***		0.3664**	-6.8279***
imports$_{(t-5)}$ (log)	(0.6420)	(1.0224)	(1.7973)		(0.1583)	(0.6494)		(0.0717)	(0.7519)		(0.1429)	(1.3725)
Net capital	-0.0172	-0.1344***	-0.1391***		0.0075	0.021		-0.0105***	0.0131		-0.0111***	0.0012
exports$_{(t-5)}$	(0.0651)	(0.0407)	(0.0394)		(0.0130)	(0.0571)		(0.0030)	(0.0489)		(0.0035)	(0.0445)
Capital per	5.4739***	1.7972	3.9581**	108.7372	0.7217**	-4.8612***	13.8168**	0.0171	-9.5120***	8.9600**	-0.0002	-8.4580***
worker$_{(t-5)}$ (log)	(1.2325)	(1.5296)	(2.0011)	(211.5155)	(0.3268)	(1.3008)	(6.4817)	(0.1030)	(1.6188)	(3.6136)	(0.1328)	(1.9988)
Multifactor	0.1507	-0.0086	0.0767	-1.7848	0.0417	0.164	-0.0694	0.0047	0.0093	-0.0372	0.0068	0.0531
productivity$_{(t-5)}$	(0.1672)	(0.0871)	(0.0934)	(4.6921)	(0.0304)	(0.1459)	(0.1883)	(0.0073)	(0.0864)	(0.1504)	(0.0085)	(0.0978)
Labor market	-0.0715	-0.3694**	-0.5201**	17.4125	0.1995***	-0.7141***	-0.9308**	0.016	0.2081	-0.5476	0.0166	-0.3633*
freedom$_{(t-5)}$	(0.1707)	(0.1836)	(0.2051)	(37.8908)	(0.0181)	(0.1030)	(0.4115)	(0.0161)	(0.1456)	(0.4525)	(0.0201)	(0.2051)
Wage	3.2438***	5.9364***	5.9003***	-20.6419			28.4293***			21.1289***		
dispersion$_{(t-4)}$	(0.4913)	(1.3217)	(1.2304)	(61.3241)			(5.9943)			(4.5209)		
Unemployment	-0.0912	0.4057***	0.4271***	17.4549			1.6668**			1.1015***		
rate$_{(t-4)}$	(0.0995)	(0.0844)	(0.1044)	(36.1642)			(0.6849)			(0.4080)		
Year fixed effects	No	No	Yes	No	No	No	No	No	No	Yes	Yes	Yes
Country fixed effects	No	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
F-test	33.3817	117.9323	79.7365	0.4169	53.7669	27.6797	34.7757	725.2245	53.3139	42.4022	298.1809	72.4894
Adj. R-Square	0.7185	0.9357	0.9363	-58.4592	0.5688	0.4347	0.6498	0.9762	0.8248	0.8143	0.975	0.8489
Observations	184	184	184	184	184	184	184	184	184	184	184	184
Hansen J				0.0475	0	0	1.3373	0	0	0.6713	0	0
p-value Hansen J				0.8275			0.2475			0.4126		

Notes: OLS and IV (2SLS) estimations including the first-stage regressions. The variables earnings dispersion and unemployment rate are instrumented using TRADE OPENNESS, NON-OECD IMPORTS and NET CAPITAL EXPORTS. Robust standard errors are reported in parentheses. ***/**/* denotes significance at the 1/5/10%-level.

Although the evidence is rather suggestive and should therefore be interpreted with caution, globalization-induced changes in the income opportunities of workers at different skill levels seem to be associated with an increase in the relative supply of skills. Whereas a more rigorous analysis of the exact channels through which trade and capital mobility affect the supply of skills is beyond the scope of this study, it might be a fruitful field for future empirical work on the distributional effects of globalization.

Seemingly unrelated regressions

A qualified concern regarding the reliability of the OLS estimates is that the analyzed transmission mechanisms are not the result of an independent optimization but reflect equilibrium outcomes that are determined jointly. Relative wages and unemployment rates, for instance, should not be studied in isolation as both are the result of interactions between labor demand and supply.

Due to the simultaneous determination of these variables, the residuals of the equations might be correlated and OLS may thus be not efficiently estimated. To cope with this issue, I have estimated a system of equations using the seemingly unrelated regressions (SUR) model proposed by Zellner (1962). Table 7.20 reports the results for the baseline specification including country and year fixed effects.[143] Since this estimation approach requires a balanced panel dataset, the number of observations is considerably lower for the SUR regressions than in the baseline estimates. To enhance the comparability of the results, Table 7.20 also presents OLS estimations based on the common sample.

The SUR-coefficients differ, at least partly, from the baseline estimates discussed in section 7.1. This does, however, not necessarily imply that the OLS estimates are biased but could also result from the different sample sizes. This is indeed what a comparison of both estimators based on a common sample suggests. The variables are widely unaffected by the choice of the estimator and the simultaneity bias seems to be not very severe. The estimates based on the common sample indicate that greater openness to international trade reduces the labor income share and the unemployment rate but raises the wage dispersion and the relative income of the unemployed in OECD countries. Moreover, the relative supply of well educated individuals is significantly higher five years after an increase in trade openness.

[143] Tables A.20 and A.21 in the appendix present the results of the pooled regressions and those including country fixed effects. The basic conclusions are the same and thus only Table 7.20 will be discussed in the text.

Table 7.20: Seemingly unrelated regression: country and year fixed effects

	OLS					SUR				
	Labor inc.	Wage dispers.	Unempl. rate	Supply hum. cap.	Inc. unempl.	Labor inc.	Wage dispers.	Unempl. Rate	Supply hum. cap.	Inc. unempl.
Trade openness$_{(t-1)}$ (log)	-0.0440*	0.5147**	-5.8832*		0.2735**	-0.0413*	0.4390**	-6.2377***		0.2043**
	(0.0246)	(0.2020)	(3.0141)		(0.1265)	(0.0224)	(0.1770)	(2.2780)		(0.0877)
Trade openness$_{(t-5)}$ (log)				21.1709***					15.4459***	
				(4.7808)					(2.6787)	
Non-OECD imports$_{(t-1)}$ (log)	-0.0052	-0.0213	-6.5688***		0.0129	-0.0088	0.062	-6.3270***		0.031
	(0.0164)	(0.1508)	(1.9793)		(0.0672)	(0.0144)	(0.1126)	(1.4610)		(0.0574)
Non-OECD imports$_{(t-5)}$ (log)				1.4843					0.1976	
				(1.7071)					(1.3437)	
Net capital exports$_{(t-1)}$	-0.0024***	-0.002	0.014		-0.0097***	-0.0025***	-0.0006	0.0252		-0.0078***
	(0.0006)	(0.0044)	(0.0495)		(0.0027)	(0.0004)	(0.0033)	(0.0434)		(0.0016)
Net capital exports$_{(t-5)}$				-0.1540**					-0.0805*	
				(0.0661)					(0.0447)	
Labor productivity$_{(t-1)}$	-0.0013		0.3152***			-0.0011		0.2975***		
	(0.0009)		(0.1110)			(0.0007)		(0.0791)		
Capital per worker$_{(t-1)}$ (log)	-0.0326	0.2749	1.3012			-0.0232	0.0277	2.5955		
	(0.0238)	(0.2116)	(2.9773)			(0.0218)	(0.1511)	(2.8077)		
Capital per worker$_{(t-5)}$ (log)				3.9138*					3.8780**	
				(2.3006)					(1.7758)	
Labor market freedom$_{(t-1)}$	-0.0017	0.0205	-0.5907		0.0117	-0.0018	0.0225	-0.6330**		0.0112
	(0.0027)	(0.0325)	(0.3784)		(0.0155)	(0.0030)	(0.0239)	(0.3110)		(0.0119)
Labor market freedom$_{(t-5)}$				-0.4306					-0.7700**	
				(0.5006)					(0.3492)	
Output gap$_{(t-1)}$			-0.4994***					-0.6168***		
			(0.1014)					(0.1090)		
Multifactor productivity$_{(t-5)}$				0.0191					-0.0001	
				(0.1298)					(0.1035)	
Left government$_{(t-1)}$					-0.0001					-0.0002
					(0.0002)					(0.0001)
Voter turnout$_{(t-1)}$					0.0022					0.001
					(0.0014)					(0.0009)
Adj. R-Square	0.8915	0.9784	0.789	0.9272	0.8076					
Observations	139	139	139	139	139	139				

Notes: OLS and SUR estimations based on a common sample. Both country and year fixed effects are included. Robust standard errors are reported in parentheses. ***/**/* denotes significance at the 1/5/10%-level.

A higher share of imports from developing countries tends to reduce the unemployment rate, whereas the relative rewards of labor, the relative income of the unemployed and the relative supply of human capital are lower if net capital exports increase.

Alternative specifications

A further concern may be related to the speed at which the examined labor market outcomes respond to changes in exposure to globalization. Tables A.10 to A.19 in appendix A.2 therefore present the results of further regressions, which experiment with the length of time lags, measure the variables in first-differences instead of levels and use five-year averages rather than yearly data. These procedures offer additional information on the relationship between globalization and labor market outcomes in the short- versus the medium- to long-run and additionally serve as a robustness check for the main results.

The analysis of the labor income share is presented in Table A.10. The impact of trade openness is widely unaffected by variations in the time lags in the specifications without year fixed effects but loses significance if year fixed effects are included. The significantly negative relationship between net exports of capital and the labor income share seems to be limited to the short-run. In particular, this variable loses its statistical significance if it is included with a lag of five or ten years. Imports from non-OECD countries seem lower the labor income share in the short- and medium-run (though only if year fixed effects are not included). The specifications reported in columns (9) to (12) are based on first-differences in the labor income and the explanatory variables instead of levels.[144] These estimates deliver rather mixed results: only trade openness has some immediately significant and negative effect, whereas the share of imports from developing countries is associated with a falling labor income share with a time lag of one period.

The results concerning the determinants of wage dispersion are shown in Table A.11. Though the impact of globalization is mostly robust, the findings suggest that the effects of trade openness and non-OECD imports tend to be stronger in the short- to medium-run than in the long-run. Moreover, the findings presented in Table A.11 do not point at a significant relationship between year-to-year differences in the globalization measures and the wage differential.

[144] The use of first differences (i.e. changes in a variable occurring between year t and t-1) already remove time-invariant but country-specific effects. A further inclusion of country fixed effects is therefore obsolete. Year fixed effects are still included in specification (14) and (16).

Table A.12 presents the estimates for the unemployment rates. Again, the influence of international trade seems to be of a rather short- or medium-term nature as the significance of the globalization variables decreases with longer time lags. The share of imports from developing countries tends to be associated with lower unemployment rates (in particular if year fixed effects are included). The effect of trade openness differs between the short- and medium-run. Without a time lag, trade openness increases the unemployment rate. This short-term effect of rising exposure to international trade is in line with the theoretical expectations (see hypothesis 3). In the medium-run (i.e. with a lag of five years), greater trade openness reduces ceteris paribus the unemployment rate. With a lag of ten years, the trade variables are not significantly correlated with the unemployment rate. Net capital exports are (if included with a time lag) significantly negatively associated with the unemployment rate if measured in levels. The regressions based on first-differences do not indicate that changes in exposure to international trade and capital mobility contribute to the explanation of the evolution of the unemployment rate in industrialized countries.

The relative supply of human capital is positively related to trade openness and is negatively related to net exports of capital (see Table A.13), whereby the size of the effect is stronger in the short- to medium-run than in the long-run. The share of imports from non-OECD countries only has a significant effect on the relative supply of human capital in specifications where it is included with a lag of ten years. The globalization indicators are not significantly related to the supply of well relative to poorly educated individuals if they are included in first differences.

Finally, Table A.14 shows the results for the regressions of the relative income of the unemployed. The effect of trade openness does not depend much on the length of the time lag. Whereas non-OECD imports become partly significant if five- or ten-year lags are used, net capital exports are statistically significant only in the short-run. Again, year-to-year differences seem not appropriate for explaining changes in the relative income of unemployed individuals.

A further concern may be that the results could be driven by cyclical effects. Hence, the Tables A.15 to A.19 report further robustness tests using five-year averages instead of yearly data to eliminate short-term fluctuations. This comes, however, at the cost of a substantial loss of observations.

Table A.15 reports the results for the labor income share. Columns (1) to (3) are devoted to the findings of regressions of the labor income share on globalization and other explanatory variables based on average values for the same five-year period.

The significance of the globalization variables tends to be lower in specifications based on five-year averages, the directions of the effects are, however, not affected. To account for potential long-term effects of globalization, columns (4) to (6) report the results of regressions, which explains the average values of the labor income share over a five-year period with the averages of the globalization variables during the preceding period. The effect of international trade remains robust but net exports of capital do not longer contribute to the explanation of the labor income share.

The estimates for the wage dispersion are presented in Table A.16. The globalization variables are again less significant than in the baseline analysis using yearly data. Furthermore, the findings do not point at a different long-term effect of globalization.

The relationship between non-OECD imports and the unemployment rate is not considerably affected by the use of five-year averages, whereas trade openness gains significance and net exports of capital are not longer significant. The further introduction of an one-period time lag reduces the impact of trade openness[145] and the share of non-OECD imports, whereas net exports of capital gain significance (although with an unexpected sign).

Table A.18 shows the results of the estimates of the relative supply of human capital. Compared to the baseline estimates, the estimated effects of globalization (especially of trade openness and capital mobility) are weaker.

Finally, the additional estimates for the relative income of the unemployed are reported in Table A.19. Despite a decreasing significance, the results do not change much. The long-term effects of globalization do not differ considerably from those in the medium-run.

The influence of the globalization indicators varies in some cases with the length of the time lags suggesting that their short-run effects on labor market outcomes may differ from those in the medium- to long-run. Nevertheless, the general findings of section 7.1 remain valid.

Different samples

To test the sensitivity of the results regarding the inclusion of certain observations, I have subsequently excluded single countries from the sample. Figure 7.1 to 7.5 show how the exclusion of each country affects the predicted coefficients of the globalization variables. This robustness test is based on the baseline specifications including year-fixed effects since the F-tests usually support their inclusion. In general, the

[145] Again, trade openness has a negative impact on the unemployment rate in the long-run.

results do not seem to be very sensitive to the exclusion of observations from single countries.[146] Nonetheless, in several cases excluding a country affects the predicted coefficients so that the point-estimates are outside the 95% confidence interval of the baseline regressions (indicated by the grey lines). The exclusion of Spain significantly reduces the coefficient of trade openness and non-OECD imports in the estimations of the labor income share. Moreover, excluding Hungary reduces the coefficient of net exports of capital for the labor income share. The coefficients of trade openness in the regressions of wage dispersion and the relative supply of human capital are significantly smaller if observations from the U.S. are not included, whereas the estimated effect of trade openness and imports of developing countries on the relative income of unemployed persons is lower if the UK or the U.S. are excluded.[147] Moreover, the predicted effect of net capital exports on the relative income of unemployed persons is higher if observations from the U.S. are not included.

Most panel studies of the labor market effects of globalization in industrialized countries are based on data for the 1980s and 1990s. Insofar, this study extends the period of analyses by including also observations for the 2000s. To test whether the inclusion of these observations affects the results and thus the comparability of findings with earlier studies, I exclude observations for the years since 2001 (post-2000) and 2006 (post-2005). The latter is reasonable because the severe financial and economic crisis experienced by several countries since 2006 might blur the results. Indeed, the exclusion of more recent observations significantly increases the estimated coefficients of international trade on the labor income share and lowers the coefficients of net capital exports. Without observations for the 2000s, the estimated impact of trade openness on wage dispersion and the relative supply of human capital is significantly higher, too. For net exports of capital the predicted effect for the unemployment rate and partly also for the relative income of the unemployed is significantly higher, whereas the coefficient significantly decreases in the regressions of wage dispersion.

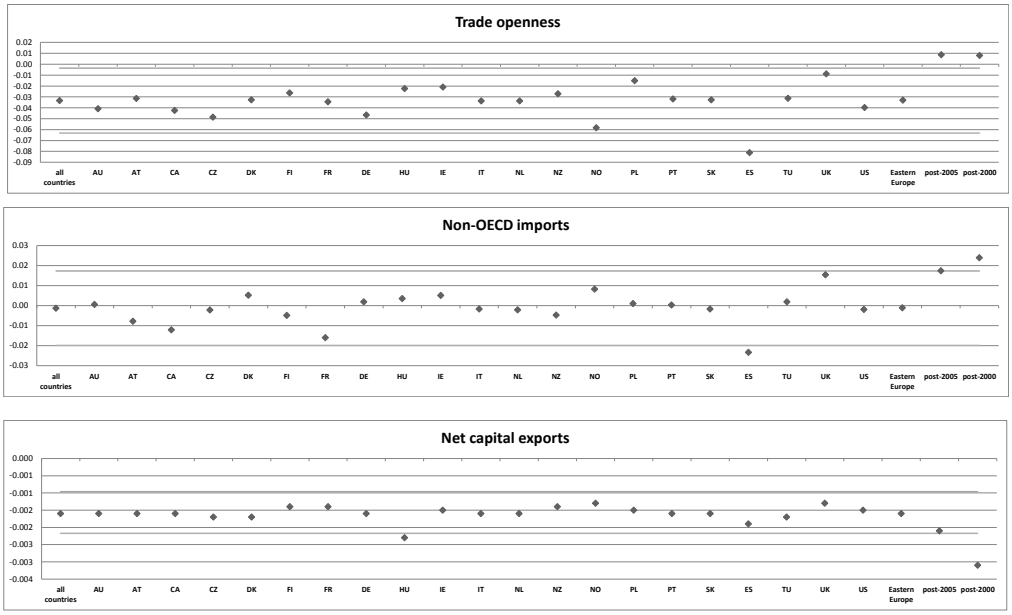
In sum, this exercise suggests that panel studies on the consequences of globalization for a set of labor market outcomes can still provide new insights. Especially, since the availability of more recent data allows to analyze whether the effects of globalization have changed since the 1990s.

---

[146] To avoid that the results are driven by a few influential observations, I have also calculated the Cook's D to detect outliers. This measure does, however, not exceed a critical value of one.

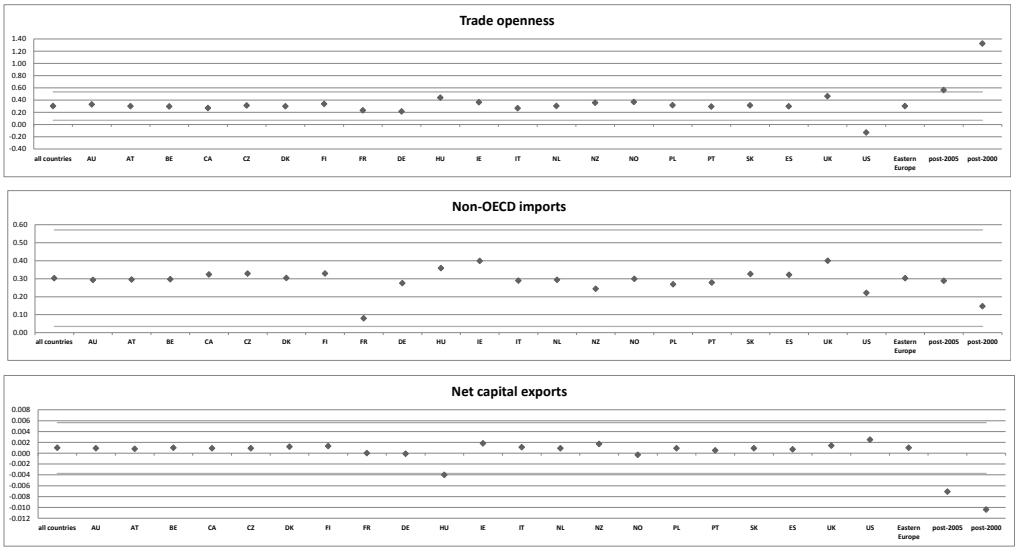
[147] Although in these cases, the point estimates do not deviate much from the confidence interval.

Figure 7.1: Labor income share: exclusion of countries and time periods



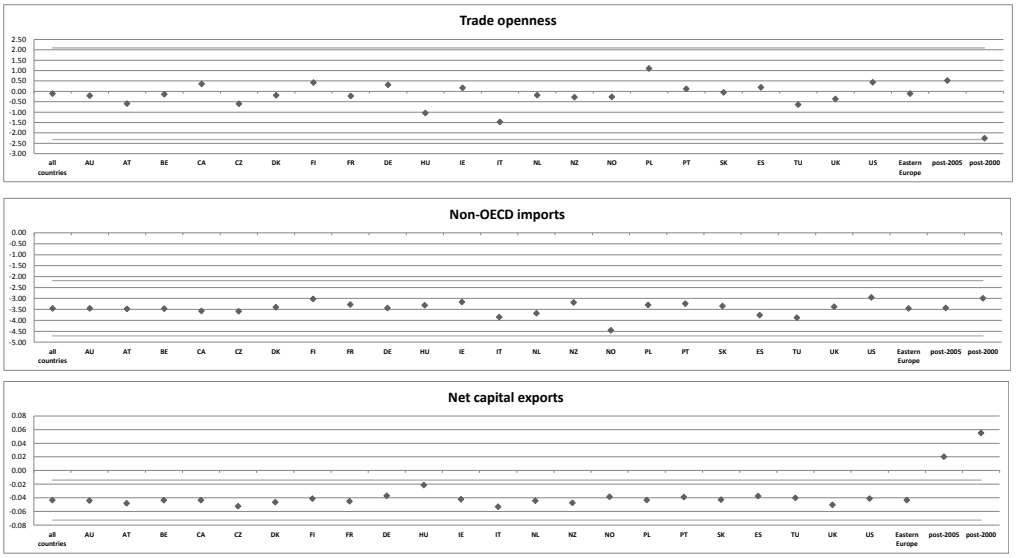
Notes: The coefficients of the globalization variables (denoted by the dots) excluding several countries and years are estimated using specification (12) in Table 7.2. The upper and lower bounds of the 95% confidence interval of the baseline estimates (based on the full sample) is marked by the grey lines.

Figure 7.2: Wage dispersion: exclusion of countries and time periods



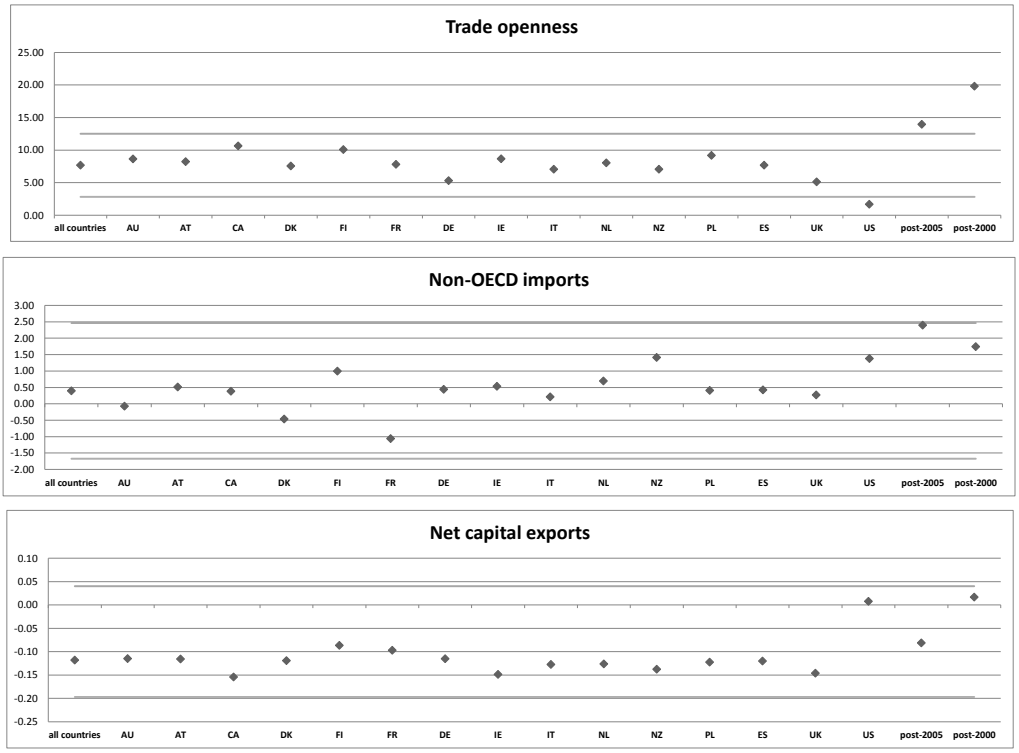
Notes: The coefficients of the globalization variables (denoted by the dots) excluding several countries and years are estimated using specification (12) in Table 7.4. The upper and lower bounds of the 95% confidence interval of the baseline estimates (based on the full sample) is marked by the grey lines.

Figure 7.3: Unemployment rate: exclusion of countries and time periods



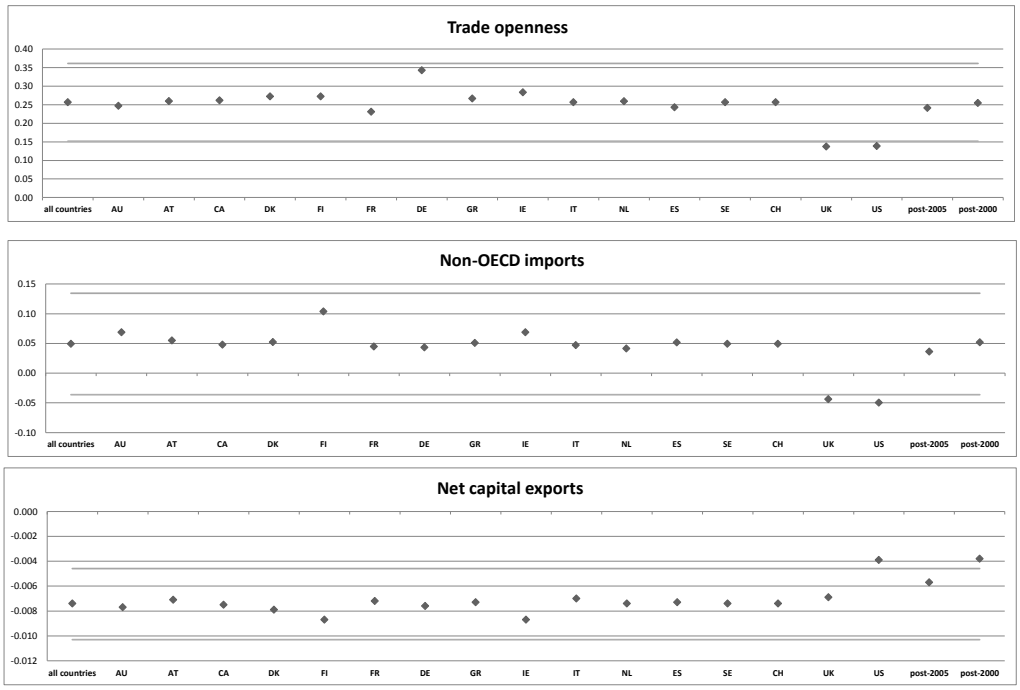
Notes: The coefficients of the globalization variables (denoted by the dots) excluding several countries and years are estimated using specification (12) in Table 7.6. The upper and lower bounds of the 95% confidence interval of the baseline estimates (based on the full sample) is marked by the grey lines.

Figure 7.4: Relative human capital supply: exclusion of countries and time periods



Notes: The coefficients of the globalization variables (denoted by the dots) excluding several countries and years are estimated using specification (12) in Table 7.8. The upper and lower bounds of the 95% confidence interval of the baseline estimates (based on the full sample) is marked by the grey lines.

Figure 7.5: Relative income unemployed: exclusion of countries and time periods



Notes: The coefficients of the globalization variables (denoted by the dots) excluding several countries and years are estimated using specification (12) in Table 7.10. The upper and lower bounds of the 95% confidence interval of the baseline estimates (based on the full sample) is marked by the grey lines.

7.2 Labor market outcomes and the distribution of incomes

The following section is devoted to the analysis of the relationship between labor market outcomes and the personal distribution of market and disposable incomes as well as the redistribution of incomes via taxes and transfers. This empirical analysis is supposed to answer the question to which extent (globalization-induced) changes of the transmission variables affect income inequality. For that purpose, the Gini coefficients of market and disposable income inequality and the extent of income redistribution (i.e. the difference between the Gini coefficients of market and disposable income inequality as a percentage of market income inequality) are regressed on the five transmission variables both with and without the inclusion of additional control variables.[148]

To test the robustness of the results and to consider the potential heterogeneity between countries as well as time-specific effects, each specification is estimated both using pooled OLS and fixed effects models (both with and without the inclusion of period fixed effects). The income distribution data is available only infrequently and thus several years include only observations for one country. Hence, the inclusion year fixed effects would lead to a further loss of observations. Nevertheless, to account for time-specific effects, I introduce period fixed effects capturing ten-year periods from 1960 to 2010.[149]

Market income inequality

The estimated impact of the five transmission variables on the Gini coefficient of the market income distribution is reported in Table 7.21. In columns (1) to (3), the transmission variables are jointly considered as determinants of the level of inequality in the distribution of market incomes among working-age households. The specifications (4) to (6) repeat the baseline estimations without including the relative income of the unemployed since this should not directly affect the distribution of market incomes, which do not cover transfer incomes and therefore the main income source for unemployed individuals.[150] The GDP per capita and its square are

[148] The choice of control variables and their definition is described in section 6.1.1 and 6.2.4.

[149] The years 2000 to 2010 are divided into two periods to capture a potential impact of the financial, economic and debt crisis starting in 2007. Consequently, dummy variables are included for the following periods: 1960-69, 1970-79, 1980-89, 1990-99, 2000-06 and 2007-10.

[150] The generosity of the replacement income might, however, indirectly affect market income inequality through work incentives and the duration of unemployment spells or higher reser-

included in columns (7) to (9). Business cycle effects are proxied by the deviation of the real GDP growth rate from its five-year average and are included in columns (10) to (12). Moreover, the specifications shown in columns (13) to (15) include both controls.[151]

The results depend, at least partly, on the choice of the estimator. The F-tests indicate that the country fixed effects are jointly significant and that the fixed effects model is, hence, more appropriate for the analysis of market income inequality.[152]

The empirical findings indicate that in particular the incidence of unemployment is a significant driver of the level of market income inequality. A higher unemployment rate is thereby associated with a more dispersed distribution of market incomes. In addition, a higher labor income share is related to a more egalitarian distribution of market incomes. This effect is, however, only significantly different from zero if country fixed effects are included and in specifications that do not include the GDP per capita.[153] The relative income of unemployed persons tends to be related to a lower market income inequality only in the pooled OLS regressions. The dispersion of wages tends to translate into a greater market income inequality although this effect is not robust to the inclusion of period fixed effects and the GDP per capita. Finally, the relative supply of human capital has significantly negative coefficients in two cases.[154]

vation wages.

151 I have also tested the impact of further control variables but they did not reach conventional levels of significance and are thus not included.

152 The period fixed effects are jointly significant only if GDP per capita is not included.

153 In this case, the labor income share remains marginally significant only if period fixed effects are included.

154 The coefficients of the share of well relative to poorly educated individuals fail to be significant in the fixed effects estimates.

Table 7.21: Market income inequality (Gini coefficients)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Labor inc.	0.1214	-37.6760***	-25.9620***	0.3774	-31.9205***	-21.9784**	3.5379	-13.4884	-16.4949*	1.6105	-37.1349***	-26.3773**	1.2445	-12.8740	-17.0107*
share	(11.8073)	(9.5815)	(9.2783)	(9.0303)	(8.8462)	(8.8286)	(9.0455)	(8.9548)	(9.5368)	(12.2075)	(11.1805)	(10.0051)	(9.2212)	(9.5067)	(10.0186)
Wage	3.8619***	9.0002***	2.3478	3.5688***	9.2406***	3.3342	3.3221***	2.5392	0.8016	3.8733***	8.9906**	2.3386	3.2844***	2.5259	0.7909
disp.	(0.8382)	(3.3359)	(4.2889)	(0.7851)	(2.5666)	(3.3612)	(0.6996)	(2.9976)	(3.4201)	(0.8321)	(3.4096)	(4.3078)	(0.7250)	(3.0488)	(3.4435)
Unempl.	0.3836**	0.7963***	0.6986***	0.4351***	0.8044***	0.7069***	0.4954***	0.8242***	0.7724***	0.3938**	0.7992***	0.6960***	0.4829***	0.8276***	0.7691***
rate	(0.1705)	(0.1305)	(0.1338)	(0.1434)	(0.1192)	(0.1112)	(0.1548)	(0.1295)	(0.1638)	(0.1677)	(0.1325)	(0.1336)	(0.1522)	(0.1293)	(0.1610)
Rel. supply	0.0608	-0.1598	-0.1409	0.0866	-0.1442	-0.0930	-0.2073*	0.0303	0.0007	0.0571	-0.1603	-0.1406	-0.2112*	0.0294	0.0014
human cap.	(0.1124)	(0.2611)	(0.2066)	(0.1261)	(0.2039)	(0.1701)	(0.1193)	(0.2807)	(0.2831)	(0.1138)	(0.2614)	(0.2080)	(0.1159)	(0.2824)	(0.2855)
Rel. income	-9.8416***	-3.7450	1.1004				-9.1555***	0.4088	1.7338	-9.5903***	-3.6596	1.0567	-9.5219***	0.5048	1.6798
unemployed	(2.7918)	(3.4292)	(2.3503)				(2.4197)	(2.0508)	(1.9425)	(2.9368)	(3.3368)	(2.4831)	(2.5088)	(2.1105)	(2.0774)
GDP							0.0001	0.0013**	0.0011**				0.0001	0.0013**	0.0011**
per capita							(0.0004)	(0.0006)	(0.0005)				(0.0004)	(0.0006)	(0.0005)
squared GDP							0.0000	-0.0000	-0.0000				0.0000	-0.0000	-0.0000
per capita							(0.0000)	(0.0000)	(0.0000)				(0.0000)	(0.0000)	(0.0000)
Dev. real										0.0952	0.0175	-0.0114	-0.1526	0.0197	-0.0143
GDP growth										(0.2706)	(0.1388)	(0.1275)	(0.2221)	(0.1083)	(0.1103)
Period															
fixed	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes
effects															
Country															
fixed	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
effects															
Adj. R-Square	0.4748	0.8102	0.8471	0.4669	0.8394	0.8698	0.6186	0.8683	0.8615	0.4674	0.8057	0.8431	0.6159	0.8651	0.8577
Obs.	65	65	65	79	79	79	65	65	65	65	65	65	65	65	65
F-test		14.9707	3.4012		16.6830	2.6230		17.0721	0.8245		14.3926	3.4356		15.0770	0.8903
p-value		0.0000	0.0177		0.0000	0.0451		0.0000	0.5180		0.0000	0.0172		0.0000	0.4797

Notes: OLS and fixed effects regressions. Robust standard errors are reported in parentheses. ***/**/* denotes significance at the 1/5/10%-level.

Redistribution

Table 7.22 reports the findings of the regressions of the extent of redistribution (i.e. the difference in the Gini coefficients before and after taxes and transfers[155]) on the five transmission variables. The first three columns are based on regressions including only the transmission variables. Specifications (4) to (6) further account for business cycle effects that might affect the measured degree of inequality and thereby also the reduction of market-induced income differences through redistribution. The relevance of the relative income of unemployed persons for the extent of income redistribution likely depends on the incidence of unemployment in the population. Rising incomes of unemployed relative to working persons should have a stronger impact on general income redistribution if more individuals are unemployed and therefore benefit from more generous replacement incomes. Hence, the specifications (7) to (9) interact the unemployment rate with the relative income of unemployed individuals. Finally, the specifications (10) to (12) include additional variables capturing political factors such as the strength of left wing parties and voter turnout.

The results are less robust and significant than for the estimates of market income inequality.[156] The labor income share is not significantly related to income redistribution. The estimated impact of the wage dispersion is not robust. Based on the pooled OLS regressions, the results point at a negative relationship between wage inequality and redistribution. The coefficients of wage dispersion become significantly positive if year fixed effects and either the interaction between the unemployment rate or political factors are considered.[157] The relative supply of human capital mostly fails to be a significant predictor of the degree of redistribution. A higher share of well educated persons is, however, significantly negatively related to the extent of income redistribution (in the fixed effects regressions) if political factors are included as control variables.

[155] Expressed as a percentage of the Gini coefficient before taxes and transfers (i.e. market income inequality).

[156] This might, however, simply reflect the fact that the extent of income redistribution via taxes and transfers is an outcome of political decisions. Redistributive policies are unlikely to be affected immediately by changing labor market conditions. Moreover, most of the transmission variables primarily affect the distribution of market incomes.

[157] The F-test suggests that the inclusion of country fixed effects is appropriate, whereas the period fixed effects fail to be jointly significant.

Table 7.22: Redistribution

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Labor inc.	-16.4644	-14.1331	-12.0067	-7.8461	-7.1026	-0.4879	-7.5701	-14.8130	-6.9527	-9.1105	-16.9512	-10.7046
share	(12.2681)	(13.8973)	(15.2301)	(14.0053)	(13.7575)	(16.0983)	(13.4332)	(13.5254)	(16.7127)	(19.7814)	(14.8208)	(17.1961)
Wage	-6.8238***	6.0164	9.7619	-6.7576***	5.8908	10.0148	-6.6052***	7.0480	12.8054*	-6.2002*	9.7872	18.0072***
disp.	(1.8352)	(5.8421)	(7.0392)	(1.8313)	(5.8903)	(6.9105)	(1.8274)	(5.6628)	(7.4100)	(3.1269)	(6.6535)	(6.2027)
Unempl.	0.4579	0.9530***	1.0575***	0.5169	0.9914***	1.1293***	0.4574	0.9356***	1.1032***	0.3861	0.9176***	1.0488***
rate	(0.4241)	(0.2359)	(0.2749)	(0.4118)	(0.2281)	(0.2624)	(0.3978)	(0.2089)	(0.2397)	(0.4257)	(0.2492)	(0.2558)
Rel. supply	0.0911	-0.4304	-0.4908	0.0697	-0.4375	-0.4993	0.0398	-0.4932	-0.5678	-0.0881	-0.7174*	-1.1267***
human cap.	(0.2160)	(0.3572)	(0.3430)	(0.2119)	(0.3538)	(0.3281)	(0.2114)	(0.3487)	(0.3434)	(0.2484)	(0.3761)	(0.3488)
Rel. income	12.3445*	4.8557	1.4516	13.7992**	5.9643	2.6645	12.5183**	8.5133*	5.4330	19.4113**	8.7737	8.9051
unemployed	(7.1022)	(4.4243)	(4.9976)	(6.6648)	(4.2930)	(4.7867)	(5.4308)	(4.7820)	(4.4299)	(7.4785)	(7.1059)	(5.6185)
Dev. real				0.5512	0.2276	0.3173	0.4670	0.1742	0.3070	0.1757	-0.0835	-0.1801
GDP growth				(0.4675)	(0.2253)	(0.2324)	(0.4676)	(0.2256)	(0.2173)	(0.5086)	(0.2384)	(0.2184)
Unempl. rate ×							3.8468*	2.8894*	3.8941**			
Rel. inc. unempl.							(2.0531)	(1.4794)	(1.7157)			
Voter										-0.0315	0.1739	0.2768
turnout										(0.0878)	(0.1098)	(0.1682)
Left										-3.1904*	0.0288	-0.4400
government										(1.6529)	(0.7558)	(0.8536)
Period fixed effects	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes
Country fixed effects	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Adj. R-Square	0.3402	0.8281	0.8243	0.3477	0.8273	0.8261	0.3686	0.8389	0.8498	0.3860	0.8374	0.8762
Observations	65	65	65	65	65	65	65	65	65	59	59	59
F-test		175.1405	0.6327		116.2721	0.8618		100.6411	1.4566		47.5720	4.6844
p-value		0.0000	0.6422		0.0000	0.4956		0.0000	0.2351		0.0000	0.0043

Notes: OLS and fixed effects estimations. Robust standard errors are reported in parentheses. ***/**/* denotes significance at the 1/5/10%-level.

Countries where the relative income of unemployed persons vis-à-vis workers is higher also reduce more of the market income inequality via redistribution. Interestingly, this positive effect fails to be significant in the fixed effects model. This suggests that this relationship is dominated by differences between countries but less appropriate for explaining developments within a country. The further inclusion of the interaction between the unemployment rate and the relative income of unemployed individuals partly raises the significance of the correlation between the relative income of the unemployed and the general reduction of income inequality. Moreover, the interaction between the unemployment rate and the relative income of the unemployed shows that higher relative incomes of the unemployed influence the overall level of redistribution in particular if the unemployment rate is higher. Finally, the empirical analysis points at the unemployment rate as the most relevant explanatory factor for the extent of income redistribution in industrialized countries: a higher share of unemployed individuals significantly increases income redistribution in the fixed effects regressions.

Disposable income inequality

Finally, Table 7.23 reports how changes in the examined labor market outcomes translate into a higher (or lower) inequality in the distribution of disposable incomes. Columns (1) to (3) report the coefficients of market income inequality and redistribution. The Gini coefficient of the distribution of disposable incomes is, by definition, fully explained by the Gini coefficient of market income inequality and the degree of redistribution. The estimates, however, offer information about the relative impact of both variables. The Gini coefficient of disposable income inequality increases by 0.72 points if market income inequality rises by one Gini point. On the other hand, a one percentage point reduction of market-induced inequality is related to a 0.38 points lower Gini coefficient of disposable income inequality.[158] Increasing inequality of market incomes does therefore not equally raise the dispersion of disposable incomes. Hence, there is no evidence for an erosion of the welfare state.

[158] The variable REDISTRIBUTION is defined as the reduction of market-induced inequality as a percentage of market income inequality. Thus, the same reduction of inequality (measured in Gini points) can lead to different values for this variable depending on the initial level of market inequality.

Table 7.23: Disposable income inequality (Gini coefficient)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Market income	0.7199***	0.7244***	0.7064***						
inequality	(0.0137)	(0.0131)	(0.0197)						
Redistribution	-0.3724***	-0.3866***	-0.3876***						
	(0.0070)	(0.0135)	(0.0128)						
Labor income				17.4300**	-14.1557*	-8.6938	16.9941**	-13.1131	-8.1959
share				(7.7875)	(7.9194)	(9.4318)	(7.4342)	(8.5569)	(10.0782)
Wage				3.4819***	4.2565**	1.6448	3.4932***	4.2628**	1.6674
dispersion				(0.6480)	(2.0858)	(1.6918)	(0.6566)	(2.0702)	(1.6656)
Unemployment				0.2932**	0.2200**	0.1621*	0.2923**	0.2235**	0.1644*
rate				(0.1315)	(0.0858)	(0.0815)	(0.1325)	(0.0859)	(0.0823)
Relative supply				0.2168***	0.0951	0.0379	0.2160***	0.0858	0.0345
human capital				(0.0797)	(0.1564)	(0.1356)	(0.0803)	(0.1505)	(0.1350)
Relative income				-12.7297***	-4.2507**	0.0691	-12.8141***	-3.9802**	0.1665
unemployed				(2.4562)	(1.9377)	(1.7563)	(2.4742)	(1.7741)	(1.8697)
Deviation real							-0.0395	0.0756	0.0309
GDP growth							(0.2027)	(0.1203)	(0.1148)
Period fixed effects	No	No	Yes	No	No	Yes	No	No	Yes
Country fixed effects	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Adj. R-Square	0.9925	0.9956	0.9959	0.4970	0.8660	0.8919	0.4907	0.8648	0.8900
Observations	121	121	121	83	83	83	83	83	83
F-test		27.1932	1.8026		26.8743	4.4041		25.6785	4.3388
p-value		0.0000	0.1350		0.0000	0.0037		0.0000	0.0041

Notes: OLS and fixed effects estimations. Robust standard errors are reported in parentheses. ***/**/* denotes significance at the 1/5/10%-level.

Columns (4) to (6) of Table 7.23 present the results of the regression of the Gini coefficient of disposable income inequality on the transmission variables without further controls, whereas the specifications (7) to (9) also consider a possible bias of the measured level of inequality due to different positions in the business cycle. The labor income share is significantly positive in the pooled OLS regressions but negative if country fixed effects are included. In the latter case, the coefficient is, however, only significantly different from zero if business cycle effects are not considered. A more unequal distribution of wages translates into greater inequality of the income after taxes and transfers (though the effect is not significant once period fixed effects are taken into account). A higher relative income of the unemployed has a significant negative impact on the Gini coefficient of disposable incomes (both in the pooled OLS and country fixed effects regressions). The relative supply of human capital tends to be positively related with disposable income inequality (though this effect is only significant in the pooled OLS regressions). As already indicated by the analysis of market income inequality and the extent of redistribution, the unemployment rate is a major driver of income inequality: higher unemployment rates are related to a more unequal distribution of disposable incomes.

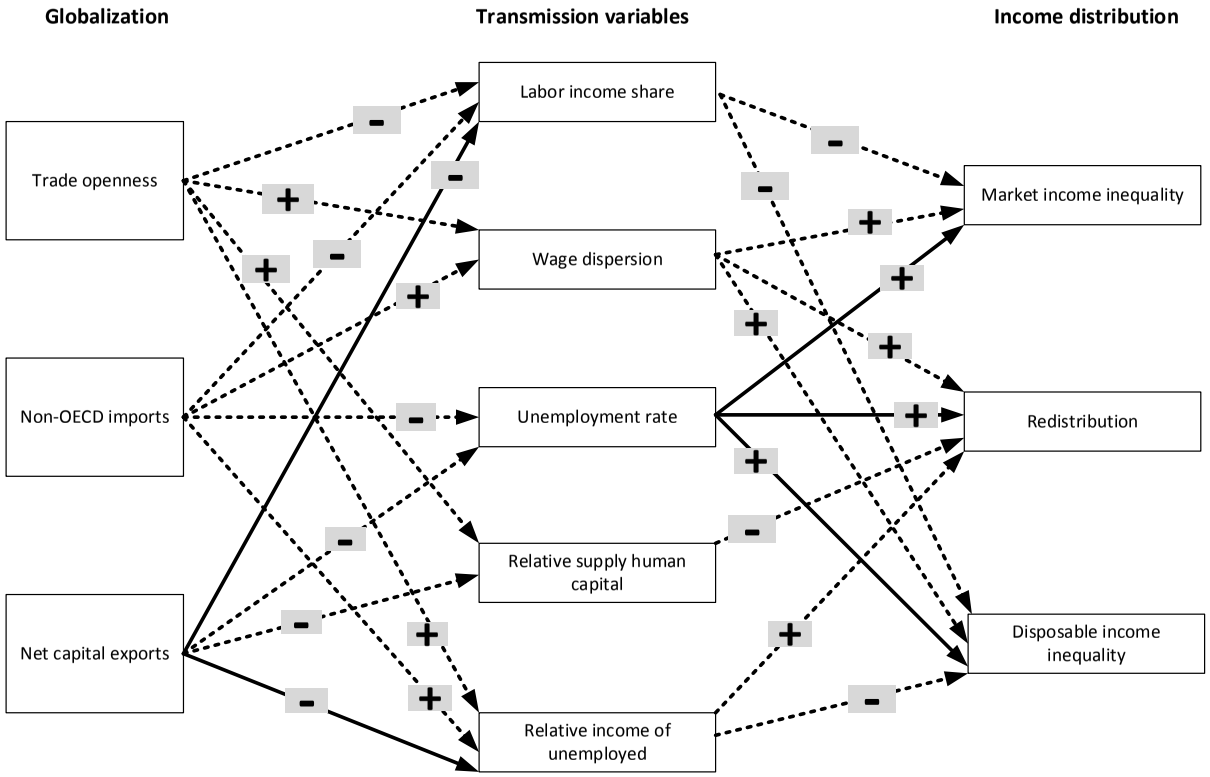
Chapter 8

Quantification of the relative effects of the transmission mechanisms

After the discussion of the main results and their robustness, the following chapter aims at quantifying the relative impact of the transmission mechanisms on the income distribution and the extent to which they are affected by globalization.

The main results of chapter 7 are summarized in Figure 8.1. International trade and net exports of private capital reduce the labor income share. Whereas net exports of capital remain statistically significant in all specifications, international trade fails to be significant in some cases. Moreover, the degree of wage dispersion tends to rise if a country engages in international trade. The effects of globalization on the relative factor rewards are in line with the theoretical expectations but its impact on the unemployment rate is less obvious. Trade openness is not significantly related with unemployment and imports from non-OECD countries seem to reduce the unemployment rate. Surprisingly, also net exports of private capital are negatively correlated with the unemployment rate (though the effect is not always significant). The relative supply of human capital rises in response to past trade openness and declines if the exports of capital increase. Finally, the income of unemployed persons relative to workers is lower if net exports of capital rise but increases with a greater exposure to international trade. Hence, a possible "race to the bottom" in welfare state spending is not supported by the empirical analysis.

Figure 8.1: Globalization and its impact on the income distribution through the transmission mechanisms



Notes: Flow chart summarizing the sign and significance of the main results from the fixed effects estimations presented in Tables 7.2 to 7.10 and 7.21 to 7.23. The dashed lines indicate that the coefficients are not always statistically significant, whereas the arrows with solid lines show robustly significant relationships.

The influence of the transmission variables on the distribution of market and disposable incomes as well as income redistribution is also illustrated in Figure 8.1. A higher labor income share reduces market income inequality and has no significant impact on the income distribution. Hence, the inequality in the distribution of disposable incomes declines if labor receives a higher share of the national income. Higher differences in the distribution of wages among full-time workers raise both the Gini coefficient of market income inequality and the extent to which these income differences are reduced through redistribution. The effect on market income inequality seems to dominate the impact on redistribution since the wage dispersion is also positively correlated with the Gini coefficient of disposable incomes. The unemployment rate is also positively related with the market income inequality, income redistribution and disposable income inequality. In contrast to the other transmission variables, the unemployment rate is statistically significant in all specifications. The relative supply of human capital is negatively and partly significantly related with income redistribution. Finally, the relative income of unemployed individuals tends to increase income redistribution and thus lower the inequality in the distribution of disposable income inequality.

Although these results are not fully robust to variations in the specifications and sample, the basic implications remain mostly valid. So far, however, the focus was on the signs and the significance of the coefficients but the quantitative effects of globalization and the transmission mechanisms have not been assessed. Hence, Table 8.1 presents the standardized beta coefficients calculated for the baseline estimations.[159] To assess the relative importance of specific transmission variables, I use only those observations that are available for the analysis of the determinants of all transmission variables (see the first five columns) or for all regressions including the income distribution variables (see the remaining columns), respectively. Despite the considerable loss of observations and the associated difficulty to identify significant effects, this procedure is still necessary because otherwise it would not be clear whether differences in the relative influence of transmission variables are simply driven by the sample composition.[160]

Keeping these limitations in mind, colums one to five in Table 8.1 suggest that trade openness reduces the labor income share and the unemployment rate but raises

[159] The significance of the effects reported in Table 8.1 is, in most cases, considerably lower than for the main results in chapter 7. This is likely a consequence of the lower number of observations that have been used for the regressions shown in Table 8.1.

[160] For the interpretation of the quantitative effects reported in this chapter, one should be aware that the observations underlying these estimates are restricted to the 1990s and 2000s.

the degree of wage dispersion, the relative supply of human capital and the relative income of unemployed persons. An increase in trade openness by one standard deviation (equal to 0.52 for this sample) reduces the labor income share by 0.64 standard deviations (or by approximately 2 percentage points).[161] At the same time, a rise in trade openness by one standard deviation increases the wage dispersion by nearly 0.4 standard deviations or 27 percentage points. The relative supply of human capital grows by 2.24 standard deviations after trade openness has risen by one standard deviation five years ago. In that case, the ratio between individuals with tertiary education and those with primary education increases by 11.7 percentage points.

The share of imports from non-OECD countries is only significantly related to the unemployment rate: if the share of these imports rises by one standard deviation, the unemployment rate falls by 2.27 percentage points, which is equal to nearly 86 percent of the standard deviation. Moreover, the unemployment-reducing effect of non-OECD imports is the only significant relationship between globalization and the transmission mechanisms in the smaller sample. Net exports of capital are associated with a significantly lower labor income share, relative supply of human capital and relative income of unemployed individuals. If the net outflows of private capital (as a percentage of GDP) increase by one standard deviation, the labor income share will be 1.1 percentage points lower, whereas the relative supply of human capital and the relative income of the unemployed decreases by 5.3 and 4.4 percentage points.

The remaining columns of Table 8.1 present the standardized beta coefficients, which are estimated based on a common sample for the empirical analysis of both the transmission variables and the income distribution measures. The empirical analyses are thus based on only 41 observations.

In the first step of the analysis (i.e. the estimation of the transmission variables) only three of the globalization variables remain statistically significant.[162] The unemployment rate is significantly negatively associated with the international trade variables. An increase of trade openness by one standard deviation reduces the unemployment rate by 2.9 standard deviations or 9 percentage points. Furthermore, an increase of the share of non-OECD imports by one standard deviation lowers the unemployment rate by 5 percentage points. The relative income of unemployed individuals depends negatively on net capital exports. A rise of net exports of pri-

[161] The changes in percentage points are calculated based on the standard deviation of the respective variables for the current sample.

[162] The p-values (reported in parentheses) indicate the effect of net capital exports on the labor income share and of non-OECD imports on wage dispersion are only marginally insignificant.

vate capital by one standard deviation reduces the income of unemployed persons relative to workers by 4.7 percentage points.

The analysis of the income distribution is presented in the last three columns of Table 8.1. Only four of the beta coefficients are also significant.[163] The results indicate that a rise of the unemployment rate by one standard deviation increases the Gini coefficient of market income inequality by 0.37 standard deviations. The unemployment rate also affects the distribution of disposable incomes. The Gini coefficient of disposable incomes increases by 0.27 standard deviations if the unemployment rate rises by one standard deviation. Unemployment has thus a stronger effect on the distribution of market incomes than on disposable incomes. This is likely a consequence of income redistribution, which reduces market-induced income differences resulting from unemployment and therefore prevent an equal increase in disposable income inequality.

The globalization-induced changes of the distribution of market and disposable incomes that are transmitted through the unemployment rate can be described as follows: a rise in the trade openness (imports from non-OECD countries) reduce the unemployment rate by 9 (5) percentage points[164] and thereby lower market income inequality by 4 (2.35) Gini points. The impact of international trade on the distribution of disposable incomes that is transmitted through the unemployment rate leads to the following changes. If trade openness rises by one standard deviation, then the Gini coefficient of disposable incomes declines by 3.6 points. A one standard deviation higher share of non-OECD imports further reduce disposable income inequality by 2.1 Gini points.

Moreover, the relative supply of human capital is significantly positively related to a higher market inequality and, surprisingly, also income redistribution. A rise in the relative supply of well versus poorly educated individuals by one standard deviation increases market income inequality by 1.06 standard deviations or about four Gini points and income redistribution by 0.50 standard deviations (or 4.1 percentage points). In this case, however, the changes in the relative supply of human capital are not driven by developments in international trade and capital mobility.

[163] The p-values shown in parenthesis further indicate that most coefficients are not close to being significant, except for the impact of the labor income share on disposable income inequality and the relative income of the unemployed on income redistribution.

[164] This is equal to 287 (166) percent of the standard deviation in the Gini coefficient of market income inequality.

Table 8.1: Quantitative effect of globalization-induced changes in transmission variables

	Common sample transmission mechanisms Transmission variables					Common sample transmission mechanisms and inequality measures Transmission variables					Inequality measures		
	Lab. inc. share	Wage disp.	Unempl. rate	Rel. supply human cap.	Rel. inc. unempl.	Lab. inc. share	Wage disp.	Unempl. rate	Rel. supply human cap.	Rel. inc. unempl.	Market inc. inequality	Disp. inc. inequality	Redist.
Trade openness$_{(t-1)}$ (log)	-0.6418*	0.3954**	-1.1810*		1.2152**	-0.7695	-0.0770	-2.8696**		0.7610			
	(0.0763)	(0.0124)	(0.0538)		(0.0330)	(0.5776)	(0.8197)	(0.0336)		(0.5346)			
Trade openness$_{(t-5)}$ (log)				2.2372***					2.4954				
				(0.0000)					(0.1794)				
Non-OECD imports$_{(t-1)}$ (log)	-0.0484	-0.0105	-0.8512***		0.0370	0.4017	-0.3089	-1.6640**		0.0855			
	(0.7545)	(0.8881)	(0.0013)		(0.8483)	(0.5663)	(0.1143)	(0.0218)		(0.8826)			
Non-OECD imports$_{(t-5)}$ (log)				0.0947					-0.1203				
				(0.3867)					(0.8195)				
Net capital exports$_{(t-1)}$	-0.3023***	-0.0128	0.0239		-0.3667***	-0.3066	0.0435	-0.1212		-0.3593**			
	(0.0000)	(0.6575)	(0.7781)		(0.0006)	(0.1112)	(0.4011)	(0.4480)		(0.0284)			
Net capital exports$_{(t-5)}$				-0.1011**					0.0175				
				(0.0218)					(0.9169)				
Labor income share											0.1712	0.2519	-0.1722
											(0.4448)	(0.1180)	(0.2511)
Wage dispersion											-0.3483	0.2564	-0.5745
											(0.6529)	(0.3947)	(0.1586)
Unemployment rate											0.3714***	0.2712***	-0.0021
											(0.0002)	(0.0008)	(0.9744)
Relative supply of human capital											1.0634**	-0.0318	0.4966***
											(0.0102)	(0.7777)	(0.0068)
Relative income of unemployed											-0.2071	0.0345	-0.1976
											(0.3723)	(0.7425)	(0.1032)
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
Adj. R-Square	0.8863	0.9784	0.7855	0.9229	0.7715	0.7759	0.9883	0.7010	0.8838	0.8318	0.9031	0.9561	0.9532
Observations	139	139	139	139	139	41	41	41	41	41	41	41	41

Notes: Fixed effects estimations. Reported are the standardized beta coefficients and the p-values indicating the level of significance. The regressions of the transmission mechanisms include year fixed effects, whereas the estimation of the income distribution variables is based only on country fixed effects. The regressions include further explanatory variables that have been used in the baseline specifications (not reported).

Chapter 9

Conclusion

The coincidence between growing exposure to international trade as well as capital mobility and the dispersion of incomes experienced by many industrialized countries has raised the question of a possible causal relationship between these developments. The existing empirical evidence on this issue is, however, inconclusive. I argue that these mixed empirical findings may be explained by the focus of many studies on only one specific aspect of the possible distributional consequences of globalization. These studies, thereby, ignore alternative channels through which economic integration likely affects the distribution of incomes.

I have reviewed the literature on the relationship between globalization and various labor market outcomes and identified a number of transmission mechanisms through which globalization potentially influences the distribution of market and disposable incomes in industrialized countries. In a comprehensive analysis based on a panel of 28 OECD countries between 1960 and 2010, I test empirically how globalization-induced changes in the labor income share, wage dispersion, unemployment rate, relative supply of human capital and relative income of unemployed affect the distribution of market and disposable incomes as well as redistribution.

The main results suggest that globalization indeed alters the relative rewards of production factors. International trade tends to reduce the labor income share and increases the dispersion of wages among full-time workers, whereas net exports of private capital lower the relative rewards of labor but have no significant impact on the degree of wage dispersion.

A robust finding is related to the link between globalization and the unemployment rate in OECD countries: imports from developing countries reduce unemployment, whereas trade openness mostly has no significant impact on unemployment. In contrast to the theoretical expectations, net exports of capital are negatively

related to the unemployment rate.

I further analyze how the relative supply of human capital responds to globalization-induced shifts in the relative rewards to education. These supply adjustments have, so far, been neglected in studies on the distributional consequences of international trade and capital mobility. My results show that the relative supply of human capital increases in response to trade openness and declines if a country faces higher net outflows of private capital.

Finally, international trade and capital mobility affect the relative income of unemployed persons differently. Net exports of private capital reduce the income of unemployed relative to employed individuals. International trade, however, increases the relative income of unemployed individuals.

Despite the consequences of globalization for labor market outcomes, the relationship between these outcomes and the income distribution matters for the assessment of the overall distributional effects as well. The combined findings for both steps of the empirical analysis can be summarized as follows: a greater openness to international trade increases market income inequality by lowering the labor income share and raising the wage dispersion. Imports from non-OECD countries raise market income differences through their impact on the relative factor rewards (i.e. the labor income share and wage dispersion) but tend to reduce market income inequality by lowering the unemployment rate. Moreover, net outflows of private capital increase market income differences via the labor income share but lower the corresponding Gini coefficient by decreasing the unemployment rate.

Beyond its impact on the distribution of market incomes, globalization also matters for the extent of income redistribution in industrialized countries. A greater openness toward international trade increases redistribution both by increasing the wage dispersion and the relative income of the unemployed. Moreover, a higher supply of human capital in response to greater trade openness reduces income redistribution. On the one hand, imports from developing countries raise income redistribution through a greater wage dispersion. On the other hand, imports from non-OECD countries reduce redistribution because they lower the unemployment rate and raise the relative income of unemployed individuals. Net exports of private capital lower income redistribution through their impact on the unemployment rate and the relative income of the unemployed but increase it via the relative supply of human capital.

The transmission mechanisms through which international trade and capital mobility alter the distribution of disposable incomes can be described as follows: trade

openness leads to higher (lower) differences in the distribution in disposable incomes because it reduces the labor income share and increases the wage dispersion (raises the relative income of the unemployed). Non-OECD imports have a similar impact on the Gini coefficient of the disposable income distribution but reduce inequality as well by lowering the unemployment rate. Net exports of capital also increase disposable income inequality via their negative influence on the labor income share and the relative income of the unemployed but reduce income dispersion through reducing the unemployment rate.

To sum up, the concern that globalization is a main driver of rising inequality in developed countries cannot generally be confirmed by the empirical analysis. On the contrary, the overall impact of a growing exposure to international trade and capital mobility is ambiguous. While globalization increases the differences in the factor rewards, it also reduces the unemployment rate in industrialized countries. In particular the latter effect has proven relevant for the income distribution in advanced economies. Hence, the positive employment effect of globalization tends to overcompensate the effect of a greater dispersion in factor rewards. This indicates that, probably due to productivity gains, more jobs are created by international trade and capital mobility than destroyed. It is thus possible for advanced economies to benefit from the overall welfare gains from globalization without facing a persistent and undesirable rise in income differences. The question how globalization affects the distribution of market and disposable incomes (through the identified transmission mechanisms) varies between countries depending on the design of their domestic labor market institutions. In particular, the extent of labor market regulation determines how different labor market outcomes react to increasing international trade and capital mobility. The adverse effects of international trade on the labor income share, for instance, are less pronounced if labor markets are less regulated. At the same time, a globalization-induced rise in wage dispersion is higher in less regulated labor markets and imports from developing countries reduce the unemployment rate especially in countries with less regulated labor markets. Since the unemployment rate has a stronger overall effect on income inequality in industrialized countries than the earnings distribution, deregulation of labor markets could be an appropriate way to cope with the challenges of globalization.

Part II

Policy preferences of German voters

Chapter 10

Introduction

The preceding chapters of this book focused on the impact of globalization on the personal distribution of incomes in industrialized economies. The findings of this analysis suggest that economic integration affects income inequality through different channels. The relative importance of these channels depends on domestic institutions such as characteristics of the labor market. Hence, the institutional framework may be decisive in governing the merits and risks of an increasing global competition.

In order to cope with the challenges of globalization, policy makers in many developed countries are confronted with a considerable need for reforms, for instance, in the fields of the labor market, social security and taxation. These reforms are supposed to enhance the competitiveness and efficiency of the economy and are, thus, highly desirable. In democracies, however, their political feasibility is constrained by the preferences of voters. A successful implementation of welfare-enhancing policies requires therefore a profound knowledge about the determinants of policy preferences among voters.

Against this background, the aim of the following chapters is to provide a comprehensive analysis of the determinants of voters' attitudes toward several labor market and welfare state policies. The empirical analyses are based on data on the German electorate. The focus on Germany has several advantages for this analysis due to the fundamental reforms which took place in the early 2000s. Prior to these reforms, the existence of rigid institutions hampered economic growth and employment. The reforms undertaken within the scope of the 'Agenda 2010' enhanced the institutional environment and, thereby, the competitiveness of the German economy and contributed to a substantial reduction in unemployment. Despite their positive economic consequences, these policies are not very popular within the German pop-

ulation. Especially the public opinion about the labor market (so called "Hartz") reforms suggests that reform resistance cannot fully be explained by conventional political-economic theories. These theories usually assume that an individual's support for or resistance against a certain policy can be explained by its pecuniary self-interest. Consequently, a reform proposal should be supported by persons who benefit financially (net recipients) and opposed by those who bear a financial loss. The recent labor market reforms seem to be not only opposed by individuals who experienced financial losses but are in general not very popular. The political and public discussion about the reforms of the 'Agenda 2010' often emphasizes its negative aspects and, in particular, a growing injustice and inequality.[165]

Motivated by the public opinion on the recent reforms, the following chapters analyze the determinants of German voters' attitudes toward a range of labor market, social security and redistributive policies accounting for different aspects of the contentious reforms of the 'Agenda 2010'. A comprehensive study of the factors that explain individual preferences for progressive income taxation (with wealthy individuals paying a larger share of their income in taxes than low income recipients) is provided in chapter 11. The attitudes toward market oriented labor market policies (e.g. cutting unemployment benefits and reducing interventionist policies) are further studied in chapter 12. Possible explanations for interpersonal differences in tax and labor market policy preferences are the financial self-interest, the level of information, the general assessment of the fairness of income differences and beliefs about the relevance of effort for economic success.[166] Moreover, several individual characteristics are taken into account. Chapter 13 is devoted to the empirical examination of the support of pension reforms. The main focus is on the assessment of an increase in the legal retirement age which has been part of the recent labor market reforms and is very unpopular among German voters. This analysis proposes a new possible source of pension reform resistance: an individual's (dis-)utility from work. It is argued that people with intrinsic work motivation will be less anxious about longer working years compared to people for whom work is a burden. A higher pension age should, thus, be a relatively attractive reform option for intrinsi-

[165] Compare also the current annual report by the German council of economic experts (Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung, 2013).

[166] The focus on fairness issues such as fairness preferences, the assessment of the income or social differences and the role of beliefs about the drivers of inequality is motivated by the public debate on the reforms of the 'Agenda 2010' and the availability of survey data. The individual attitudes toward redistributive policies can, of course, also be explained by other factors. In particular, individuals might accept financial losses (e.g. being a net payer to income redistribution) because of altruistic motives or simply compassion for the recipients.

cally motivated workers compared to the reform alternatives of cutting pensions or increasing contributions.

The empirical analyses of chapter 11 to 13 are based on data from the German General Social Survey ("Allgemeine Bevölkerungsumfrage der Sozialwissenschaften": ALLBUS), which is designed to be representative for the German population. ALLBUS has been conducted biannually since 1980[167] and is promoted by DFG (German Research Society) and GESIS (Institute for Social Science), which also conduct the German part of the International Social Survey Programme (ISSP). The latter program was firstly implemented in 1985 and collects data for various themes of social science annually. ALLBUS and the integrated ISSP-surveys offer plenty of valuable information on the respondents' assessment of several policies, on the individual labor market status and socioeconomic situation as well as on fairness issues.

The findings of the chapters 11 to 13 provide information on various robust correlations between policy preferences and their potential driving factors. Given that a better understanding of reform support or resistance among voters is highly relevant for a successful implementation of growth-enhancing reforms in a democracy, learning about robust correlations and patterns related to individual policy preferences is valuable. Regarding the interpretation of the results and their implications, however, one should be aware of the limitations of these empirical analyses. In particular, the econometric approach does not allow the identification of causal relationships. It is, for instance, not possible to exclude a reverse causality or that omitted variables affect the results. Moreover, the different categories of impact factors may not be fully independent of each other. Since the ALLBUS data set is a repeated cross-section, different persons are surveyed in each wave. Hence, it is not possible to control for interpersonal heterogeneity and ascribe changes in a person's policy preferences to changes in his socioeconomic situation or self-interest, for example.

The findings indicate that the mere focusing on financial self-interest as an explanation for policy preferences leaves out an important part of the story. Although variables approximating self-interest play a crucial role, other dimensions contribute substantially to our understanding of individual heterogeneity in labor market and welfare reform acceptance. In particular, individual beliefs on the sources of economic success are highly correlated with policy preferences: a person who believes

[167] For details on ALLBUS see `http://www.gesis.org/en/services/data/survey-data/allbus`

that everyone is responsible for his own economic situation tends to be less inclined to support redistributive policies.

Motivated by the relevance of beliefs for individual policy preferences, chapter 14 analyzes how individuals form their beliefs about the drivers of success in life. For that purpose, a specific feature of the German history, the separation of the country and the existence of two distinct regimes after World War II is used. Several studies point at persistent differences between individuals who have been socialized under the communist regime in East Germany and their West German fellow citizens (e.g. Alesina and Fuchs-Schündeln, 2007; Heineck and Süssmuth, 2010; Heinemann et al., 2011). These differences in policy preferences, fairness considerations and beliefs likely reflect the differential socialization and indoctrination by different regimes. Hence, chapter 14 analyzes whether indoctrination has affected East Germans' beliefs on the drivers of success by exploiting a natural experiment on the reception of West German television in the former German Democratic Republic. While the majority of GDR citizens had access to West German television already before the reunification, approximately 15 percent of the population could not receive these broadcasts due to geographical and topological reasons. Hence, the empirical analysis in chapter 14 allows the identification of a causal television effect as it makes use of an exogenous variation in access to Western television. Based on GDR survey data collected in the late 1980s and longitudinal data from the German Socio-Economic Panel for the 1990s the impact of differential access to Western television on East Germans' beliefs both before and after reunification is tested empirically.

The findings of the following chapters are of particular interest when it comes to the actual implementation of potentially growth-enhancing reforms. To foster voters' support for labor market and welfare state policies, politicians could also address issues beyond financial net gains from a certain measure. Notably, fairness considerations are found to be highly relevant for one's assessment of labor market and tax reforms. Moreover, a person's degree of intrinsic motivation can explain his willingness to accept an increase in legal retirement age. The analysis in chapter 14 further indicates that mass media may have the power to affect individual attitudes toward reforms not only by focusing on a concrete policy measure and addressing its consequences but also by changing fairness considerations. Furthermore, the latter effect may persist as it was the case with the political indoctrination of East German citizens via both West and East German television broadcasts.

Chapter 11

Preferences toward progressive taxation*

11.1 Introduction

Highly progressive tax systems confront high income individuals with substantial marginal tax rates. Thus, they entail disincentives for private economic activity and may hamper potential growth. Although the introduction of alternative tax systems might be a desirable part of a growth enhancing fiscal strategy, a transition toward a less progressive tax schedule or even a flat tax is regularly confronted with opposition. Flat tax regimes have only been possible in very few countries. Obviously, tax progression seems to be a majority preference in many industrialized countries.

While the economic effects of tax progression have received much attention (see Fuest and Huber, 2001 for a brief survey) a full understanding of its political popularity is still lacking. Basically, two alternative but not necessarily mutually exclusive explanations compete: narrow redistributive self-interest and fairness concerns.

The view that an individual's tax policy preferences are largely driven by the impact of redistributive taxation on the individual's own net income is firmly rooted in political-economic theories. These approaches postulate that individuals choose their preferred tax rate based on a narrow financial self-interest calculus (Hettich and Winer, 1997). Thus, increasing income redistribution should be supported by persons who benefit financially (net recipients), and opposed by those who are net payers to the welfare state (Meltzer and Richard, 1981). From that perspective,

* This chapter is based on a joint work with Friedrich Heinemann (see Hennighausen and Heinemann, forthcoming).

tax progression is popular simply because its distributive costs are imposed on a minority of voters.

The fairness view is supported by the behavioral literature which stresses the role of other regarding preferences, reciprocity and fairness considerations in individual optimization calculus (such as Fehr and Gächter, 2002; Fehr and Schmidt, 1999). Over the last decades, this literature has widened the understanding of "self-interest" far beyond an individual's narrow financial advantage. Moreover, it has been empirically shown that fairness motives are likely to affect individual decision making and policy preferences (Konow, 2003). Independently from the impact of a progressive taxation on their individual net income, people might support it just because they consider it to be more equitable than a flat tax schedule.

The subsequent analysis wants to widen the understanding for the relative merits of both explanations. The basic analytical idea originates from the fact that both explanations should differ in their empirical outcomes with respect to one key property. If the narrow redistributive self-interest view offers the sole relevant explanation, the support or rejection of tax progression should largely be driven by proxies which indicate a winner/loser position vis-à-vis progressive taxes. If, however, fairness considerations are also relevant, even losers from tax progression may be among its supporters. Thus, this study aims at filling an important gap in our understanding of preferences for redistributive taxation. Here it is of substantial policy relevance, since the knowledge of the determinants of individual tax preferences is crucial when it comes to an assessment of the political feasibility of tax reform proposals.

This study relates to the literature on individual preferences for income redistribution (see Alesina and Giuliano, 2009 for a survey). However, we do not focus on redistributive preferences in general but more specifically on attitudes toward progressive taxation. The existing empirical literature indicates that self-interest may not be the only impact factor of individual attitudes on redistributive taxation. Although Hite and Roberts (1991) find that self-interest is partly reflected in taxpayers' assessment of vertical equity of income tax, Wilensky (1976) shows that the perceived fairness of taxes depends mainly on subjective feelings rather than on their objective level or equity. Nevertheless, his results suggest a self-serving bias in taxpayers' perception as they assess their own (income) group as relatively deprived, while the position of other taxpayers is considered beneficial. Indicating the relevance of fairness aspects, Ackert et al. (2007) provide experimental evidence on the importance of inequality aversion for decisions on tax structures. Furthermore,

Slemrod (2006) shows that US-citizens are more likely to support a substantial tax reform if they judge the current system to be unfair.

The remainder of this chapter is organized as follows: section 11.2 offers some facts about the attitudes toward progressive taxation among German voters. The subsequent section is devoted to the identification of potential factors that explain why individuals differ in their preferences for progressive tax rates. The econometric results and several robustness tests are presented in section 11.4 and some concluding remarks are offered in section 11.5.

11.2 Attitudes toward progressive taxation within the German population

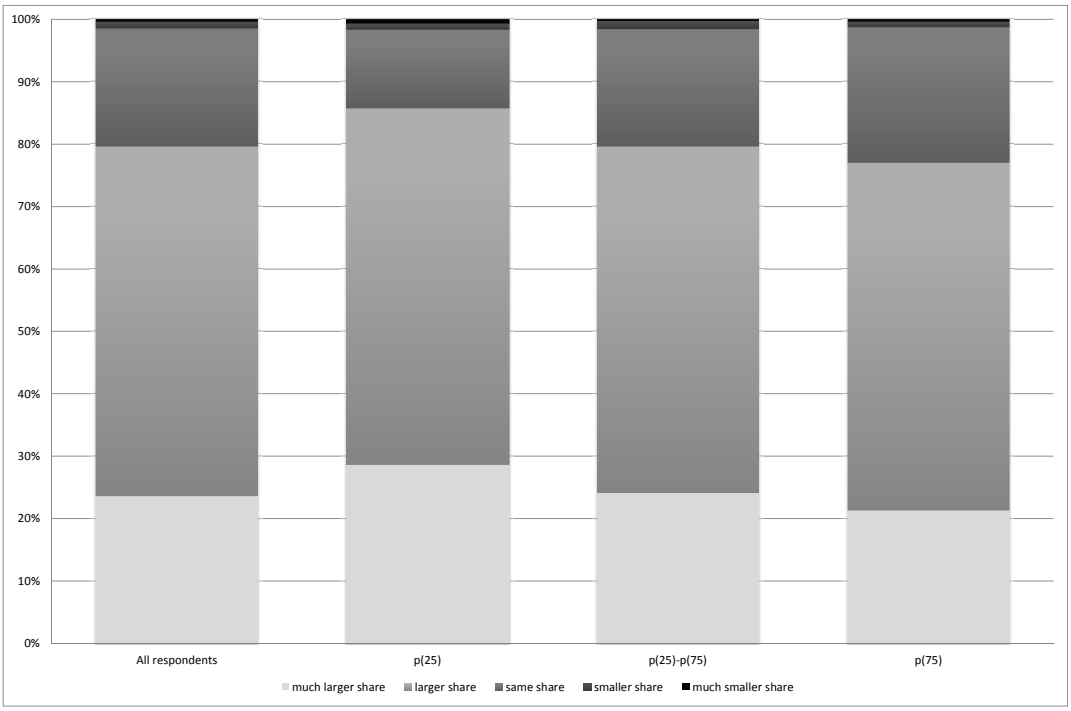
To analyze the individual determinants of voters' attitudes toward progressive taxation, we employ survey data from the German General Social Survey (ALLBUS). In the present study, we focus on data collected in the year 2000, which also includes questions designed for the *International Social Survey Programme* (ISSP). In the context of the ISSP-survey *Social Inequality III* the respondents were asked to answer the following question related to their tax preferences: "*Do you think people with high incomes should pay a larger share of their income in taxes than those with low incomes, the same share or a smaller share?*" The participants could choose between the following answers: people with high incomes should pay "*a larger*" or "*much larger share*", "*the same share*" or "*a smaller*" respectively "*a much smaller share*" of their incomes in taxes than people with lower incomes. While the first two alternatives relate to progressive tax rates, the latter correspond to a proportional and a regressive taxation respectively.[168]

Figure 1 depicts the response pattern. It is remarkable that a clear majority of the German population (nearly 80 percent) seems to favor a progressive tax system. The share of the respondents' preferring a proportional tax rate is considerably lower (19 percent), while the number of individuals choosing a regressive tax can be neglected. The three bars on the right show the tax structure preferences for different income groups.[169]

[168] A progressive tax scheme (i.e. tax payments that increase disproportionately in income) implies rising average tax rates with income (e.g. due to tax exemptions) but not necessarily increasing marginal tax rates.

[169] The allocation of the ALLBUS participants into these income groups is based on their self-reported monthly net income. The net income of the 25^{th} percentile is below 750 Euro, while the individuals belonging to the 75^{th} percentile earn at least 1500 Euro (on average the income

Figure 11.1: Preferences on income tax share for high income people



Following political-economic models, we would expect a strong link between a person's income and his preferences concerning taxation (Hettich and Winer, 1997). Applied to the individual attitudes toward different tax rates, we expect people with high incomes to be less in favor of a progressive taxation than those with low incomes. Figure 1, however, reveals a surprising uniformity of opinion across the different income groups. Even though the share of respondents choosing progressive taxation is in fact decreasing in income, the relationship seems to be rather weak. Although they are very likely to bear financial losses from a progressive tax rate, still, 77 percent of the participants belonging to the upper income quantile prefer such a tax scheme (compared to 86 percent of the respondents within the 25^{th} percentile).[170]

in the upper quantile ranges between 2250 and 2500 Euro).

[170] The weak link between income and tax preferences might also reflect the possibility that individuals belonging to the 75^{th} percentile of the income distribution do not regard themselves as high income recipients. If this is the case, the desire for progressive taxation may be motivated by self-interest: the people want others (the rich) to pay taxes. Moreover, it might also be rational for high income recipients to support redistribution (e.g. through progressive taxation) as an internalization of external effects (e.g. altruism, crime, sickness). A further argument for a collective agreement on redistribution has been put up by Buchanan and Tullock (1962) who claim that redistribution may be a social insurance against negative

Table 11.1: International comparison of preferences for progressive taxation

Country	Observations	Preference for progressive taxation (in %)
New Zealand	1067	62.51
United States	1173	64.96
Canada	937	69.18
North Ireland	749	72.39
Latvia	1017	72.66
France	1803	73.26
Norway	1243	76.03
Sweden	1123	76.31
Israel	1183	76.92
Australia	1611	77.90
Czech Republic	1382	77.95
United Kingdom	777	78.71
Germany (West)	*875*	*78.74*
Slovakia	1044	80.65
Germany (East)	*489*	*83.03*
Hungary	1159	83.96
Spain	1166	84.55
Austria	961	84.91
Poland	1032	85.24
Slovenia	971	87.74
Portugal	1129	88.30
Japan	1218	90.97
Bulgaria	1013	92.69

Notes: Population-weighted share of respondents who prefer a progressive tax system with high income people paying a (much) larger share of their income in taxes than people with lower incomes. Based on survey data from the ISSP module "Social Inequality III" collected in 1999.

The majority of German voters seems to approve a tax system that draws more on high income individuals than on low income recipients. Table 11.1 offers information about the support for progressive taxation among the population in 22 high and middle income countries. The international comparison reveals that the high support for progressive taxation is not peculiar to the German population but obviously the majority preference in many industrial countries. Since political decision making (e.g. reforms of the tax system) in representative democracies is strongly affected by public opinion, the knowledge of the determinants of public attitudes toward

income shocks (see also Varian, 1980). The presumption that all individuals (i.e. also the rich) collectively agree on income redistribution is, however, only valid given a set of conditions, which are unlikely to be met (comp. Vaubel, 2012).

tax systems is crucial when it comes to an assessment of the political feasibility of reform proposals. Although redistributive self-interest seems to correspond to these attitudes, the link is far from being as close as suggested by conventional political-economic theory. This raises the question of other relevant driving factors of individual attitudes toward tax structures beyond individual gains or losses. Since taxation is an instrument of the government to redistribute market incomes, it is reasonable to expect that fairness aspects play a major role in the formation of the corresponding attitudes.

11.3 Potential determinants of individual attitudes toward progressive taxation

As individual views on the design of the tax structure are likely to depend on very different factors, the aim of our empirical analysis is twofold. Apart from the identification[171] of the factors related to individual attitudes toward progressive taxation, we want to derive insights into the relative impact of different groups of driving factors. First, self-interest is supposed to be important as individuals are affected differently by a given tax design. Second, the level of information about taxation may differ. Furthermore, fairness considerations are likely to affect individual attitudes toward progressive taxation in several respects. Besides differences in distributive preferences, people may entertain diverging beliefs on the role of incentives and the causes of inequality. This can result in different conclusions about the efficiency and necessity of progressive taxation. Finally, it is reasonable to assume that individuals judge tax structures based on their views on the fairness of the existing income distribution.

Thus, we express the probability that an individual i prefers a progressive tax ($PROG_i$) as a function of his narrow financial self-interest ($FINSELF_i$), fairness considerations ($FAIR_i$), level of information ($INFO_i$) as well as a set of socioeconomic characteristics (IND_i):

$$Prob(PROG_i = 1) = \Phi(\beta \cdot IND_i + \delta_1 \cdot FINSELF_i + \delta_2 \cdot FAIR_i + \delta_3 \cdot INFO_i)$$

[171] The survey data used in this study does not allow a clear identification of a causal relationship. Rather, the objective of our empirical analysis is the identification of factors that are significantly correlated with tax policy preferences and, thus, have to be addressed in a successful selling of tax reforms.

The preference for progressive taxation of individual i is captured by his answer to the survey question introduced in section 11.2. The binary variable ($PROG_i$) is equal to one if the respondent states that high income recipients should pay a (much) larger share of their income in taxes than those with low incomes, and equals zero if he prefers a proportional or regressive income tax.[172]

Financial self-interest

Political-economic models assume that individual support for or resistance against income redistribution is driven mainly by a narrow self-interest, which is preoccupied with the individual's own gains or losses. Meltzer and Richard (1981) show that the median voter will choose a positive tax rate as long as he earns less than the population average and, thus, benefits financially from income redistribution.[173] Applied to the decision about the degree of tax progression, one would expect support from individuals who are net-recipients from such a tax scheme. Since the tax liability is disproportionately higher for wealthy individuals than for those with low incomes, it is reasonable to assume that the former will be less likely to support a progressive tax scheme.[174]

Financial self-interest has been proven relevant for the assessment of tax policies. Hite and Roberts (1991) find that individuals in higher income brackets are less content with the fairness of steeply progressive tax rates. Furthermore, the financial situation of individuals has been found to affect the perceived fairness of different taxes or tax systems (Slemrod, 2006).

Simple political-economic models are, however, not able to explain why individuals support redistributive policies (e.g. via progressive taxation) although they have to bear financial losses from it. One possible explanation still adhering to financial self-interest is offered by Benabou and Ok (2001). Given the possibility of income mobility, it might be rational for the currently rich (poor) to support (oppose) redistribution if they expect to earn less (more) than the population average in the future.

[172] To facilitate the interpretation of the subsequent empirical analysis, our main results are based on a probit estimation. Since the structure of the dependent variable is ordered, Table 11.5 contains information on the robustness of the results using an ordered probit approach.

[173] In this model, voters also consider work disincentives due to redistribution and the resulting welfare loss. It is, however, questionable to what extent the disincentive effects of progressive taxation are considered in the formation of public opinion on this topic. Reed-Arthurs and Sheffrin (2010) find that the public does not take them into account when making judgments on progressive taxation and furthermore does not believe that this should be done.

[174] Taxes do not only finance redistribution but also the provision of public goods. However, for the public good related part of government budgets low income individuals should also support progression.

Another aspect of income mobility has been stressed by Piketty (1995). Experienced social mobility is likely to alter the beliefs concerning the relative importance of individual effort for economic success. Individuals who experienced upward mobility may stress the relevance of effort, while those facing a loss in social status may ascribe this to bad luck (Alesina and La Ferrara, 2005).

To account both for static and dynamic (i.e. mobility related) redistributive self-interest, we exploit information on the respondents' position in the income distribution based on their individual net income[175] and the evolution of their self-reported social status over time. ALLBUS contains data about the respondents' placement in the social stratum in the year the survey has been conducted as well as ten years before. Based on this information we construct the variable SOCIAL MOBILITY.[176] This variable takes a negative value for individuals who experienced downward mobility and a positive value for those who experienced upward mobility.[177] The respondents' placement in the income distribution is measured by three dummy variables indicating whether the respondent has a LOW, INTERMEDIATE or HIGH INCOME (i.e. belongs to the bottom quantile, the middle range or the top quantile of the income distribution). We expect that the support for progressive taxation should be the highest among low income recipients and the lowest among those with high incomes, while experienced upward mobility should further reduce preferences for this tax structure.

Information

The level of information has been found to influence the individual assessment of economic policy. Boeri et al. (2002) show that a better knowledge of the functioning and costs of unfunded pension systems relates to a higher support for pension reforms. In the context of tax systems, the level of information is likely to be reflected

[175] ALLBUS only offers information on monthly net incomes. Information about income before taxes and transfers would be more appropriate to assess the financial self-interest related to tax structures. Since we are using the position in the income distribution (i.e. belonging to the 25^{th}, 25^{th} to 75^{th}, or 75^{th} percentile), the bias due to a change of an individual's income group after redistribution should be less severe compared to an analysis based on concrete amounts of income. In an earlier version of this paper, we have also used the respondents' social status to capture their self-interest and the results remain robust. Additional estimates using information on both the income and structure of the respondents' households are presented in section 11.4.2.

[176] ALLBUS only offers information on the respondents' realized but not on their expected mobility. Hence, the interpretation of the variable SOCIAL MOBILITY is limited to the consequences of mobility which are suggested by Piketty (1995) but cannot be extended to mobility expectations.

[177] More information on this and other included variables is provided in Table B.1 in the appendix.

in individual policy assessments. Slemrod (2006) argues that the observable preference of US citizens for a flat or sales tax at least partly mirrors misconceptions about the degree of tax progression of the current system. Furthermore, Sheffrin (1993) points out that tax policy concepts are rather complex and receive little attention in public debates. The general public's lack of knowledge about taxation (especially related to the concept of progression) is reflected in the fact that the framing of survey questions is likely to affect the respondents' answers (Roberts et al., 1994). Confronted with abstract questions, the majority of the respondents seem to prefer a progressive system, which is not the case if the respondents are offered a concrete example (e.g. declaration of just tax payments for different income groups). Furthermore, the evaluation of tax structures depends on whether the tax payments of different income groups have been presented in rates or in absolute values.

Thus, we would expect that the individual level of information about the tax system should be relevant for the corresponding answer behavior. ALLBUS offers no direct information on the respondents' knowledge about taxation and different tax schemes. Nevertheless, an empirical analysis of individual attitudes toward progressive taxation should take the respondents' level of information into account (at least to minimize possibly biased results due to minor knowledge). For this purpose, we make use of two types of variables to proxy the respondents' degree of information about taxation: first, we control for the level of education since Blinder and Krueger (2004) provide some evidence that higher educated individuals have a better knowledge about major economic policy issues. Hence, we introduce the dummy variables SECONDARY and UPPER SECONDARY EDUCATION as well as UNIVERSITY, which are equal to one for respondents with the corresponding degree. In addition, we employ the respondent's opinion on the IMPORTANCE OF POLITICS to his personal life. The perception that political decisions affect the own life and well-being should increase the incentive to be informed about major political topics. This relationship has also been stressed by Edlund (2003) who argues that the high relevance of fiscal policy for the Swedish population due to the welfare state generosity involves a stronger awareness of topics related to public finance. Although we would expect that a better information level reduces, ceteris paribus, biases and misunderstandings, we do not have any a priori knowledge about the direction of this bias.

Beliefs

The relevance of beliefs (e.g. concerning the underlying reasons of inequality) for welfare state preferences has been emphasized by Alesina and Angeletos (2005).[178] It has been shown empirically that beliefs matter for tax preferences. For members of parliament beliefs on company mobility affect the preferred levels of corporate taxes (Heinemann and Janeba, 2011). For voters the impact of individual effort relative to exogenous factors (like birth or luck) can explain differences in welfare state preferences (Alesina et al., 2001; Fong, 2001). The implicit assumption that everyone is responsible for his own economic situation and that inequality results from differences in individual effort should lead to a less favorable assessment of progressive taxation. The same is expected for individuals believing that incentives affect individual effort. The disincentives of increasing tax rates for private economic activity should be weighted more and, thus, lead to a more critical assessment of tax progression. The respondents' beliefs concerning the reasons for economic success are captured by the dummy variable EFFORT. This variable takes on the value one for participants stating that differences in social status reflect individual variations in effort. For the corresponding regression coefficient a negative sign is expected.

A further belief that may be relevant for tax preferences is related to the procedural fairness of the political system. Following the concept of procedural fairness, the perceived justice of a certain (policy) outcome depends on the underlying decision making process. It has been shown that procedural fairness increases the acceptance of decisions with unfavorable outcomes (Sondak and Tyler, 2007) as well as the perceived fairness of social inequality (Bischoff et al., 2008). The respondents' beliefs regarding the degree of procedural fairness of the German political system is measured by their assessment of the functioning of the democracy. The impact of the resulting dummy variable DEMOCRACY (equal to one for those claiming to be (fully) satisfied with the democracy as practiced in Germany; zero otherwise) is theoretically ambiguous. It is reasonable to assume that the effectiveness of the democratic system fosters the trust of voters in the usage of taxpayers' money. The belief in an appropriate use of public money might, however, increase the willingness

[178] In accordance with the literature (e.g. Alesina and Angeletos, 2005; Alesina et al., 2001; Giuliano and Spilimbergo, 2009; Benabou and Tirole, 2006a), we define individual beliefs as a person's view on the relative weight of discretionary (e.g. achievement, industriousness) versus exogenous factors (e.g. luck, social background) as a determinant for success and upward mobility. The survey questions used to capture beliefs thus provide information on the respondents' views about the determinants of inequality. It might, however, be the case that these questions do not exactly ask about a belief (i.e. may not asked whether a respondent *believes* that income differences exist because of differences in effort).

to pay higher taxes for all voters and, thus, facilitates the acceptance of taxes in general. Nevertheless, a comprehensive empirical analysis of attitudes toward taxation should also control for the belief in procedural fairness of the decision making process since tax rates are determined politically.

Fairness preferences and the assessment of the status quo distribution

The design of a tax system is a major part of redistributive policies in developed countries. Consequently, fairness preferences are likely to shape attitudes toward progressive taxation. The individually preferred income distribution is the benchmark to assess the existing distributive outcome. Thus, persons favoring a distribution that guarantees everyone the (financial) means necessary for a reasonable living (need principle) should diverge in their attitudes toward redistribution from those who prefer the equity principle, for example. For them, the optimizing calculus on the preferred tax system would assign a positive value to a more need-related redistribution independent from the financial consequences for themselves. The respective respondents' fairness preferences are indicated by their agreement with the statement that people should have a decent income even without achievement. For the dummy variable NEED a positive sign is expected: other things equal, individuals who prefer a distribution according to the need principle should be more supportive of a progressive taxation than those without that kind of preference.

It seems reasonable to expect that individuals who perceive the existing distribution of incomes and wealth within their country as inadequate should be in favor of redistributive policies. On the other hand, the judgment of the existing inequality as fair should decrease the demand for redistribution. Hence, we expect that individuals assessing the existing SOCIAL DIFFERENCES as (completely) just as well as those who do not observe a worsening of the situation of ORDINARY PEOPLE are less likely to exhibit preferences for progressive taxes.[179] Besides information on the respondents' assessment of the social justice, ALLBUS also includes a question related to the perceived justice of the own income situation and, thus, allows to introduce a more egocentric view on the fairness of the income distribution. The participants were asked whether the income they receive is appropriate given their

[179] The assessed fairness of existing income or social differences is captured by questions about different aspects of the distributive situation and its justice. In contrast to economic beliefs, the corresponding variables refer to the assessed justice of the actual distributive situation but not to its underlying reasons.

achievements. Based on this information, we construct the dummy variable ADEQUATE WAGE, which equals one for respondents stating to be (at least) adequately paid relative to their effort. It is hypothesized that the individuals' satisfaction with their own earnings is related to a lower demand for redistribution and, therefore, progressive taxation.

Individual characteristics

A number of personal characteristics are likely to go along with preferences for progressive taxation. Some of these characteristics capture specific aspects of the above discussed aspects of financial self-interest, information, beliefs or fairness assessments that cannot be observed directly. In addition, however, personal characteristics account for new aspects.

Focusing on policy preferences of German citizens, it is necessary to account for the historical feature of the existence of the two former German regimes. The socialization under the communist regime of the former GDR has been found to have left its marks in people's minds and beliefs (see chapter 14). The analysis in chapter 12 suggests that individuals from the former GDR are more skeptical toward market-oriented reforms of the labor market than those socialized in the Western part of Germany. Furthermore, Alesina and Fuchs-Schündeln (2007) find that, compared to their Western German countrymen, East Germans have a stronger preference for redistribution, which cannot fully be explained by their relatively low income. Motivated by the previous findings, we expect that socialization under Communism[180] implies a stronger preference for progressive taxation.

There are several reasons why older people might differ in their welfare preferences from younger individuals. First, the experience of different cohorts might differ substantially. Giuliano and Spilimbergo (2009) find that the experience of sharp recessions during early adulthood affects redistributive preferences. In line with this, older individuals may remember the substantial social inequalities before the expansion of the welfare state since the 1970s (Lindbeck, 1995; Heinemann, 2008). This socialization may make them see today's situation less critical and, therefore, perceive less necessity to redistribute. Second, uncertainty about the own economic and social status in life is larger for the young than for the old. Compared to the old, the perspective of young people with respect to their country's social

[180] Since we are interested in the effect of being socialized in the GDR and not in the respondents' current state of residence, our EAST-dummy is equal to one for respondents born in the former GDR.

situation is rather characterized by a thicker "veil of ignorance" (Rawls, 1971). As a consequence, the lower insecurity of the old may let them pay less attention to redistribution as an insurance for income risk. In addition, Sheffrin (1994) points to a possible status quo bias in the individual attitudes toward progressive taxation. Comparing British and US survey data, he finds a relatively higher preference for progressive taxation among the population in the UK and traces this back to the fact that the British taxes were more progressive than those in the US when the surveys were conducted. It seems reasonable to expect that the views of older individuals may be more biased in favor of the status quo than those of younger ones. Hence, the progressivity of the German income tax system might be reflected in a higher preference for increasing tax rates, especially among older people. The impact of a person's AGE on the tax rate preferences is, thus, a priori ambiguous.

The literature reports that women have a stronger preference for income redistribution (e.g. Corneo and Grüner, 2002). Therefore, FEMALES should also be more supportive of a highly redistributive taxation than males.

Furthermore, several variables related to the respondents' employment status are included in our empirical analysis. We would expect individuals who do not participate in the labor market (i.e. being either UNEMPLOYED or NOT EMPLOYED) and are, thus, dependent on public or private transfers to be more likely to support redistribution than those who are employed. This should also be the case for progressive taxation as these respondents should be, ceteris paribus, net recipients of this tax policy.[181]

Other things equal, self-employed individuals are more prone to take (financial) risks and might also be more individualistic. Thus, we would expect that the SELF-EMPLOYED are less supportive toward progressive taxation than employees.

Public employees are less likely to receive a high income than individuals employed in private enterprises. When it comes to pecuniary self-interest, we expect them to be in favor of a progressive tax system (relative to private economy employees). A further argument for diverging tax preferences between workers employed in the public and private sector is related to bureaucracy theories (e.g. Tullock, 1965). In general, we would expect bureaucrats to have a distinct interest in taxes as they increase their budget and, thus, power. It is, however, a priori unclear which kind of tax structure public sector employees prefer. Given the German income tax

[181] The household composition may, however, matter as respondents who are not active in the labor market and, thus, dependent on intra-household transfers might be less likely to favor redistribution if this reduces the income of their household. This issue is also addressed in the robustness tests in section 11.4.2.

legislation, the progressive tax structure is accompanied by several tax exemptions making a high number of public staff necessary. This should be favored by PUBLIC EMPLOYEES (Niskanen, 1971). We, therefore, expect individuals employed in the public sector to be more likely to prefer a progressive tax scheme.

The expected signs of the explanatory variables are summarized in Table 11.2. Table 11.3 contains the descriptive statistics of the variables included in our econometric analysis.[182]

Table 11.2: Sign expectations

	Preference for progressive taxation
Income	-
Social Mobility	-
Preference: Need Principle	+
Belief: Effort	-
Belief: Democracy	?
Fairness: Social Differences	-
Fairness: Ordinary people	-
Fairness: Adequate wage	-
Information: Importance politics	?
Information: Education	?
Age	-
Female	+
East	+
Unemployed	+
Not Employed	+
Self-Employed	-
Public Employee	+

11.4 Econometric analysis

11.4.1 Main results

Table 11.4 displays the main empirical results on the determinants of German voters' attitudes toward progressive taxation. We employ a probit approach since the dependent variable assumes the value of one for respondents choosing a (steeply) progressive taxation and a value of zero for those preferring proportional or regressive tax rates. The specification in the first column focuses on the individuals' financial

[182] It is worthwhile mentioning that the correlation between the explanatory variables (not reported) is not particularly high indicating that the multicollinearity problem should not be very severe.

Table 11.3: Descriptive statistics

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
Dependent Variable					
Tax Progression	1364	0.7957	0.4034	0	1
Financial self-interest					
Low Income	2911	0.2853	0.4516	0	1
Intermed. Income	2911	0.5675	0.4955	0	1
High Income	2911	0.1472	0.3544	0	1
Social Mobility	1401	0.2191	1.5762	-9	6
Information					
Low Education	3750	0.4816	0.4997	0	1
Sec. Education	3750	0.2801	0.4491	0	1
Upper Sec. Education	3750	0.2383	0.4261	0	1
University	3757	0.1392	0.3462	0	1
Importance Politics	3804	0.6728	0.4693	0	1
Fairness preference					
Need	3665	0.4836	0.4998	0	1
Beliefs					
Effort	3595	0.5706	0.4951	0	1
Democracy	3713	0.4929	0.5000	0	1
Fairness assessment					
Social Differences	3676	0.4178	0.4933	0	1
Ordinary People	3563	0.2660	0.4419	0	1
Adequate Wages	1210	0.5240	0.4996	0	1
Others					
Age	3804	47.58	17.23	18	95
Female	3804	0.5209	0.4996	0	1
East	3804	0.3826	0.4861	0	1
Unemployed	3797	0.0526	0.2233	0	1
Not Employed	3797	0.4387	0.4963	0	1
Self-Employed	3797	0.0630	0.2429	0	1
Public Employee	3797	0.1257	0.3316	0	1

self-interest. The second column includes proxies for the respondents' fairness preferences and beliefs. The variables capturing the respondents' fairness assessment are introduced in the specification shown in column 3. The final specification includes all categories of impact factors (column 4). The individual characteristics as well as the proxies for the respondents' level of information are controlled for in all specifications. There are basically two reasons for a gradual inclusion of the different categories of impact factors: first, this proceeding serves as a robustness check. Second, some of the impact factors are likely to be channels through which other included determinants affect the individual attitudes toward progressive taxation. In their empirical analysis of German survey data, Bischoff et al. (2008) show that the respondent's fairness perception of the status quo is shaped by fairness preferences, beliefs on the sources of economic success and the degree of procedural fairness as well as self-interest and several socioeconomic factors. Thus, it is meaningful to analyze the impact of the different categories of explanatory factors both separately and jointly to get valuable information on the net effects.

The findings in Table 11.4 support the view that individual preferences for progressive taxation are driven by one's own redistributive gains and losses. While the experience of social mobility fails to be significant in all four regressions, the individuals current position in the income distribution affects their attitudes toward tax progression. As expected, the support for progressive taxation is highest among individuals with a low income. The quantitative impact is also sizable: the probability to favor progressive taxes is, other things equal, 9 to 12 percentage points lower for middle income recipients than for individuals who belong to the lowest income group. In addition, belonging to the 25 percent of the sample with the highest individual net income reduces the likelihood of supporting progression by 16 to 19 percentage points compared to low income recipients.

Indicating that the attitudes toward different tax structures are not shaped solely by the tax impact on one's own net income, an essential overall result is the relevance of fairness aspects. First, fairness preferences are found to be a significant determinant of individual tax preferences: the probability of supporting progressive taxation is almost 6 percentage points higher for individuals preferring a distribution according to the need principle than for those entertaining different fairness preferences. Second, the respondents' economic beliefs are reflected in their views on tax policy. According to our estimates, persons attributing differences in social status to the interpersonal variation in effort show, ceteris paribus, a 10 to 12.5 percentage points lower probability of favoring tax rates that increase in income than

Table 11.4: Determinants of German voters' attitudes toward progressive taxation

	(1)	(2)	(3)	(4)
Financial self-interest				
Intermed. Income	-0.1060***	-0.1293***	-0.0924**	-0.1212***
	(0.0329)	(0.0343)	(0.0365)	(0.0374)
High Income	-0.1818***	-0.1916***	-0.1626***	-0.1850***
	(0.0491)	(0.0495)	(0.0539)	(0.0531)
Social Mobility	-0.0083	-0.0034	-0.0004	0.0049
	(0.0080)	(0.0081)	(0.0088)	(0.0087)
Fairness preferences				
Need		0.0570**		0.0593**
		(0.0253)		(0.0268)
Beliefs				
Effort		-0.1270***		-0.1004***
		(0.0258)		(0.0298)
Democracy		0.0299		0.0539*
		(0.0260)		(0.0282)
Fairness assessment				
Social Differences			-0.0593**	-0.0192
			(0.0287)	(0.0311)
Ordinary People			-0.0619**	-0.0755***
			(0.0294)	(0.0287)
Adequate Wage			-0.0961***	-0.0994***
			(0.0276)	(0.0277)
Information				
Importance Politics	-0.0381	-0.0393	-0.0317	-0.0374
	(0.0270)	(0.0279)	(0.0293)	(0.0296)
Secondary Education	0.0188	0.0232	0.0304	0.0463
	(0.0322)	(0.0326)	(0.0347)	(0.0344)
Upper Sec. Education	-0.0035	-0.0098	-0.0023	-0.0028
	(0.0418)	(0.0418)	(0.0452)	(0.0444)
University	0.0266	-0.0002	0.0260	0.0042
	(0.0453)	(0.0448)	(0.0480)	(0.0467)
Further individual characteristics				
Age	0.0024**	0.0036***	0.0041***	0.0051***
	(0.0010)	(0.0011)	(0.0012)	(0.0012)
Female	-0.0130	-0.0063	-0.0082	0.0016
	(0.0257)	(0.0262)	(0.0279)	(0.0279)
East	0.0346	0.0240	0.0000	0.0056
	(0.0255)	(0.0265)	(0.0282)	(0.0287)
Unemployed	-0.0034	-0.0113	0.0151	-0.0028
	(0.0566)	(0.0580)	(0.0650)	(0.0635)
Not Employed	-0.0508	-0.0600	-0.0789*	-0.0825*
	(0.0382)	(0.0388)	(0.0439)	(0.0440)
Self-Employed	0.0194	0.0205	0.0191	0.0145
	(0.0531)	(0.0525)	(0.0545)	(0.0528)
Public Employee	0.0780**	0.0765**	0.0713*	0.0665
	(0.0391)	(0.0386)	(0.0416)	(0.0403)
Regression diagnostics				
Pseudo R2	0.0313	0.0706	0.0677	0.1098
Observations	1034	963	871	827

Notes: Probit estimates (reported are average marginal effects). */**/*** denotes significance at 10%/ 5%/ 1% level.

those without this belief. The impact of the belief concerning the functioning of the democratic system is, however, less clear cut: controlling for the perceived fairness of the status quo, we find that the satisfaction with the effectiveness of the political system leads to a 5.4 percentage points higher probability of demanding a relatively higher taxation of wealthy persons (though only marginally significant).

Little surprising, the assessed justice of the existing distributive situation is a relevant factor for the individual tax preference. Being content with the fairness of social differences tends to lower the probability of favoring tax progression by nearly 6 percentage points. However, the variable social differences loses significance if individual fairness preferences and beliefs are included. The perceived situation of ordinary people is significantly related to preferences for progressive taxation. Individuals who do not gauge a worsening of the situation of ordinary people show a 6 to 7.5 percentage points lower tendency to demand a disproportional higher taxation of high income recipients. Finally, the satisfaction with the fairness of the own earnings leads to a significantly lower support for progressive taxes. The perceived justice of the own earnings has (with a marginal effect of approximately 10 percentage points) proven to be relevant for the formation of welfare state preferences.

While our proxies for the respondents' level of information do not contribute significantly to the explanation of tax attitudes, the respondents' age, being not employed, and employment in the public sector are related to tax preferences. Both public employees and older people tend to be more likely to favor a progressive taxation, while persons who are not employed are less inclined to support this tax policy.

11.4.2 Robustness of the results

The empirical analysis suggests that the respondents' preferences for progressive taxation do not solely depend on financial self-interest. Beyond that, other factors such as fairness considerations enter the individuals optimizing calculus on the preferred degree of progressiveness. The subsequent section presents the results of several additional estimations that test the robustness of our general findings.

Ordered probit estimates

The first robustness test is motivated by the ordered structure of dependent variable.[183] The results of the ordered probit estimations are presented in Table 11.5.

[183] The original survey question used to measure the attitudes toward progressive taxation contains five answer categories. For the ordered probit robustness check a three-step-scale is

The marginal effects are calculated for each of the three categories of the dependent variable and, thus, represent the impact of the explanatory variable on the probability that an individual chooses either of these categories (i.e. prefers a tax policy with rich people paying a higher, the same or a smaller share of their incomes in taxes). In general, the findings are widely unaffected by the choice of the ordered probit approach. An exception is the impact of information since both the perceived importance of politics and the education variables are now partly significant.

Additional controls and specification of individual incomes

Table 11.6 contains the results of additional estimates including further controls[184] and provides further information on the impact of the individuals' pecuniary interest. Instead of the respondents position within the income distribution, we capture the static financial self-interest by including binary variables referring to different net income categories. The estimates confirm that individuals with the lowest income tend to be most supportive to progressive taxation. As a further robustness check, we include additional individual control variables capturing the respondents' job status as blue versus white collar worker and his religiosity (i.e. membership in an institutionalized religious community). Our main results are unaffected by the inclusion of these variables. While religiosity has no significant effect on individual attitudes toward progressive taxation, being a blue collar worker increases the probability of preferring progressive tax rates by 11 percentage points.

exploited since we pooled the observations in the categories indicating that the rich should pay *a smaller* or *much smaller* share of their income in taxes as well as those related to *a larger* or *much larger* share. This is necessary because only 21 respondents state that they prefer a regressive taxation (i.e. that the rich should compared to the poor pay a (much) smaller share of their income in taxes). An analysis including all five categories is, thus, not reasonable.

184 Descriptive statistics for all variables that are introduced in this section are presented in Table B.5 in the appendix.

Table 11.5: Robustness test: ordered Probit estimates

	higher share				same share				smaller share			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Intermed. Income	-0.1008***	-0.1314***	-0.0874**	-0.1223***	0.0872***	0.1147***	0.0777**	0.1093***	0.0136***	0.0167***	0.0096**	0.0130***
	(0.0324)	(0.0338)	(0.0360)	(0.0369)	(0.0280)	(0.0295)	(0.0320)	(0.0329)	(0.0054)	(0.0060)	(0.0048)	(0.0055)
High Income	-0.1727***	-0.1895***	-0.1587***	-0.1866***	0.1495***	0.1654***	0.1412***	0.1667***	0.0232***	0.0241***	0.0175***	0.0199***
	(0.0483)	(0.0487)	(0.0531)	(0.0522)	(0.0418)	(0.0425)	(0.0472)	(0.0467)	(0.0084)	(0.0086)	(0.0076)	(0.0080)
Social Mobility	-0.0059	-0.0016	-0.0002	0.0053	0.0051	0.0014	0.0002	-0.0047	0.0008	0.0002	0	-0.0006
	(0.0078)	(0.0079)	(0.0086)	(0.0085)	(0.0067)	(0.0069)	(0.0077)	(0.0076)	(0.0011)	(0.0010)	(0.0009)	(0.0009)
Need		0.0493**		0.0548**		-0.0431**		-0.0489**		-0.0063**		-0.0058**
		(0.0248)		(0.0263)		(0.0217)		(0.0235)		(0.0035)		(0.0033)
Effort		-0.1266***		-0.1090***		0.1105***		0.0974***		0.0161***		0.0116***
		(0.0253)		(0.0293)		(0.0221)		(0.0262)		(0.0051)		(0.0046)
Democracy		0.0311		0.0526*		-0.0272		-0.0470*		-0.004		-0.0056*
		(0.0255)		(0.0276)		(0.0223)		(0.0247)		(0.0034)		(0.0034)
Social Differences			-0.0514*	-0.0095			0.0458*	0.0085			0.0057*	0.001
			(0.0283)	(0.0305)			(0.0252)	(0.0273)			(0.0035)	(0.0033)
Ordinary People			-0.0541*	-0.0675**			0.0482*	0.0603**			0.0060*	0.0072**
			(0.0290)	(0.0282)			(0.0258)	(0.0252)			(0.0036)	(0.0037)
Adequate Wage			-0.0926***	-0.0978***			0.0824***	0.0874***			0.0102***	0.0104***
			(0.0272)	(0.0273)			(0.0242)	(0.0244)			(0.0041)	(0.0042)
Importance Politics	-0.0388	-0.0459*	-0.0386	-0.0489*	0.0336	0.0401*	0.0344	0.0437*	0.0052	0.0059*	0.0043	0.0052*
	(0.0264)	(0.0273)	(0.0288)	(0.0291)	(0.0229)	(0.0238)	(0.0257)	(0.0260)	(0.0038)	(0.0038)	(0.0034)	(0.0034)
Secondary Education	0.0418	0.0462	0.0537	0.0684**	-0.0362	-0.0403	-0.0478	-0.0612**	-0.0056	-0.0059	-0.0059	-0.0073**
	(0.0316)	(0.0320)	(0.0341)	(0.0337)	(0.0274)	(0.0280)	(0.0304)	(0.0302)	(0.0044)	(0.0043)	(0.0040)	(0.0041)
Upper Secondary Education	0.0153	0.0085	0.0204	0.0191	-0.0132	-0.0074	-0.0182	-0.0171	-0.0021	-0.0011	-0.0022	-0.002
	(0.0409)	(0.0408)	(0.0444)	(0.0434)	(0.0354)	(0.0357)	(0.0395)	(0.0388)	(0.0055)	(0.0052)	(0.0049)	(0.0046)
University	0.0221	-0.0023	0.0173	-0.0044	-0.0191	0.002	-0.0154	0.0039	-0.003	0.0003	-0.0019	0.0005
	(0.0444)	(0.0437)	(0.0471)	(0.0456)	(0.0384)	(0.0381)	(0.0419)	(0.0407)	(0.0060)	(0.0056)	(0.0052)	(0.0048)
Age	0.0028***	0.0040***	0.0045***	0.0055***	-0.0024***	-0.0035***	-0.0040***	-0.0049***	-0.0004***	-0.0005***	-0.0005***	-0.0006***
	(0.0010)	(0.0010)	(0.0012)	(0.0012)	(0.0009)	(0.0009)	(0.0010)	(0.0011)	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Female	-0.0046	0.0011	-0.0007	0.0066	0.004	-0.001	0.0006	-0.0059	0.0006	-0.0001	0.0001	-0.0007
	(0.0253)	(0.0257)	(0.0274)	(0.0274)	(0.0219)	(0.0224)	(0.0244)	(0.0245)	(0.0034)	(0.0033)	(0.0030)	(0.0029)
East	0.0251	0.0143	-0.0105	-0.0039	-0.0217	-0.0124	0.0093	0.0035	-0.0034	-0.0018	0.0012	0.0004
	(0.0250)	(0.0260)	(0.0277)	(0.0281)	(0.0216)	(0.0227)	(0.0247)	(0.0251)	(0.0035)	(0.0033)	(0.0031)	(0.0030)
Unemployed	-0.0131	-0.0292	0.0052	-0.017	0.0113	0.0254	-0.0046	0.0152	0.0018	0.0037	-0.0006	0.0018
	(0.0550)	(0.0560)	(0.0630)	(0.0614)	(0.0476)	(0.0489)	(0.0560)	(0.0549)	(0.0074)	(0.0072)	(0.0069)	(0.0065)
Not Employed	-0.0546	-0.0615	-0.0832*	-0.0845*	0.0473	0.0537	0.0741*	0.0755*	0.0073	0.0078	0.0092*	0.0090*
	(0.0375)	(0.0380)	(0.0431)	(0.0432)	(0.0324)	(0.0332)	(0.0383)	(0.0386)	(0.0053)	(0.0052)	(0.0054)	(0.0053)
Self-Employed	0.0242	0.0274	0.0231	0.0205	-0.0209	-0.0239	-0.0206	-0.0183	-0.0033	-0.0035	-0.0025	-0.0022
	(0.0524)	(0.0516)	(0.0538)	(0.0520)	(0.0453)	(0.0450)	(0.0479)	(0.0465)	(0.0071)	(0.0066)	(0.0060)	(0.0056)
Public Employee	0.0720*	0.0725*	0.0716*	0.0688*	-0.0623*	-0.0632*	-0.0637*	-0.0615*	-0.0097*	-0.0092*	-0.0079*	-0.0073*
	(0.0385)	(0.0379)	(0.0410)	(0.0397)	(0.0333)	(0.0330)	(0.0365)	(0.0355)	(0.0056)	(0.0053)	(0.0050)	(0.0047)
Pseudo R2	0.027	0.0656	0.0602	0.1039	0.027	0.0656	0.0602	0.1039	0.027	0.0656	0.0602	0.1039
Observations	1034	963	871	827	1034	963	871	827	1034	963	871	827

Notes: Ordered probit estimates (reported are average marginal effects for each category of the dependent variable). */**/*** denotes significance at 10%/ 5%/ 1% level.

Differential impact of fairness consideration for different income groups

A key result of our empirical analysis is the relevance of fairness considerations (i.e. fairness preferences and assessments as well as beliefs) in explaining German voters' attitudes toward progressive taxation. A possible interpretation of this finding may be that tax rate preferences do not only reflect a person's position in the income distribution but are also driven by fairness preferences, beliefs and the assessment of the current distribution. It is, however, possible that fairness considerations do not have an independent impact on tax policy preferences but are themselves a consequence of individual financial self-interests. This is indeed suggested by the psychological literature, which refers to a "self-serving bias" (e.g. Babcock and Loewenstein, 1997). This bias affects the perception and judgements since individuals tend to regard an advantageous (disadvantageous) outcome as fair (unfair). Hence, the effect of fairness preferences and assessments might be driven predominantly by low income respondents who benefit from a progressive taxation and, therefore, regard it as fair. Likewise, mostly high income recipients might believe that effort matters for success.

As a first descriptive test of this argument's validity, we compare the mean values of the fairness variables for different income groups. The first three columns of Table 11.7 compare two subsamples with differ with regard to the respondents' net incomes. The results suggest that the 50 percent of the individuals with the lowest net incomes indeed significantly differ in their fairness preferences, beliefs and assessments from the 50 percent with the highest incomes. Individuals in the upper half of the income distribution are less likely to prefer the need principle but are more inclined to stress the role of effort for success and to assess the social and their own situation as fair. To check whether this result is driven by low or high income respondents, Table 11.7 compares the respondents with the lowest as well as highest individual net income (10^{th} and 90^{th} percentile) with the remaining sample. On average, low income persons do not entertain significantly different fairness preferences, beliefs or assessments than the other respondents. In contrast to that, high income persons (the ten percent of the sample with the highest incomes) are, on average, significantly more inclined to believe that effort matters and to regard the social or their own situation as fair. In line with this, rich individuals do less often prefer the need principle. Thus, the observable differences between individuals in the lower and upper half of the income distribution predominantly reflect different assessments by high income respondents.

Table 11.6: Robustness test: different income groups and additional control variables

	(1)	(2)	(3)
Income 300-500	-0.0230		
	(0.1125)		
Income 500-750	-0.0646		
	(0.1067)		
Income 750-1000	-0.1791*		
	(0.1039)		
Income 1000-1250	-0.1424		
	(0.1039)		
Income 1250-1500	-0.2175**		
	(0.1047)		
Income 1500-2000	-0.1258		
	(0.1061)		
Income 2000-2500	-0.1457		
	(0.1151)		
Income 2500-3000	-0.2451**		
	(0.1208)		
Income > 3000	-0.3302***		
	(0.1182)		
Intermed. Income		-0.1322***	-0.1220***
		(0.0375)	(0.0374)
High Income		-0.1722***	-0.1857***
		(0.0532)	(0.0531)
Social Mobility	0.0061	0.0040	0.0049
	(0.0086)	(0.0087)	(0.0087)
Need	0.0585**	0.0671**	0.0608**
	(0.0267)	(0.0269)	(0.0269)
Effort	-0.1008***	-0.0981***	-0.1002***
	(0.0297)	(0.0296)	(0.0298)
Democracy	0.0475*	0.0585**	0.0558*
	(0.0284)	(0.0282)	(0.0283)
Social Differences	-0.0172	-0.0242	-0.0184
	(0.0310)	(0.0310)	(0.0311)
Ordinary People	-0.0823***	-0.0739**	-0.0751***
	(0.0286)	(0.0286)	(0.0287)
Adequate Wage	-0.0980***	-0.0960***	-0.0984***
	(0.0276)	(0.0276)	(0.0277)
Importance Politics	-0.0464	-0.0345	-0.0363
	(0.0297)	(0.0295)	(0.0297)
Secondary Education	0.0476	0.0612*	0.0439
	(0.0342)	(0.0347)	(0.0345)
Upper Sec. Education	0.0041	0.0218	-0.0045
	(0.0448)	(0.0450)	(0.0445)
University	0.0022	0.0129	0.0028
	(0.0471)	(0.0462)	(0.0467)
Age	0.0052***	0.0052***	0.0051***
	(0.0012)	(0.0012)	(0.0012)
Female	-0.0082	0.0243	0.0021
	(0.0282)	(0.0289)	(0.0279)
East	0.0089	-0.0004	-0.0017
	(0.0285)	(0.0286)	(0.0308)
Unemployed	0.0011	0.0002	-0.0062
	(0.0639)	(0.0628)	(0.0636)
Not Employed	-0.0859*	-0.0385	-0.0825*
	(0.0440)	(0.0465)	(0.0440)
Self-Employed	0.0256	0.0544	0.0145
	(0.0537)	(0.0541)	(0.0528)
Public Employee	0.0654	0.0832**	0.0675*
	(0.0404)	(0.0402)	(0.0404)
Blue collar		0.1141***	
		(0.0415)	
Religion			-0.0202
			(0.0314)
Pseudo R2	0.1231	0.1190	0.1103
Observations	827	827	827

Notes: Probit estimates (reported are average marginal effects). */**/*** denotes significance at 10%/ 5% /1% level.

Table 11.7: Fairness considerations of low and high income individuals (comparison of mean values)

				Low incomes			High incomes		
	$\leq 50^{th}$ perc.	$> 50^{th}$ perc.		$< 10^{th}$ perc.	$\geq 10^{th}$ perc.		$\geq 90^{th}$ perc.	$< 90^{th}$ perc.	
	(1)	(2)	(2) - (1)	(3)	(4)	(4) - (3)	(5)	(6)	(6) - (5)
				Need					
Mean	0.5580	0.4008	-0.1572***	0.5256	0.4863	-0.0393	0.3229	0.5066	0.1836***
(Std.Err.)	(0.0124)	(0.0140)		(0.0315)	(0.0098)		(0.0292)	(0.0098)	
Obs.	1593	1220		253	2560		257	2556	
				Effort					
Mean	0.5263	0.5617	0.0354*	0.5766	0.5384	-0.0381	0.621	0.5338	-0.0872***
(Std.Err.)	(0.0126)	(0.0142)		(0.0314)	(0.0099)		(0.0303)	(0.0099)	
Obs.	1556	1214		248	2522		256	2514	
				Social differences					
Mean	0.3053	0.4319	0.1266***	0.3622	0.3597	-0.0024	0.5429	0.3417	-0.2012***
(Std.Err.)	(0.0114)	(0.0141)		(0.0302)	(0.0094)		(0.0311)	(0.0093)	
Obs.	1608	1220		254	2574		256	2572	
				Ordinary people					
Mean	0.2261	0.3022	0.0761***	0.2235	0.2625	0.0389	0.3886	0.2463	-0.1423***
(Std.Err.)	(0.0105)	(0.0133)		(0.0266)	(0.0087)		(0.0310)	(0.0086)	
Obs.	1561	1191		246	2506		247	2505	
				Adequate wage					
Mean	0.4246	0.5384	0.1138***	0.4133	0.4849	0.0716	0.6451	0.4618	-0.1832***
(Std.Err.)	(0.0220)	(0.0230)		(0.0572)	(0.0166)		(0.0498)	(0.0168)	
Obs.	504	468		75	897		93	879	

Notes: Comparison of mean values of the variables NEED, EFFORT, SOCIAL DIFFERENCES, ORDINARY PEOPLE and ADEQUATE WAGE for different income groups. The assignment of individuals to different income groups is based on their individual net income. */**/*** denotes significance at 10%/ 5%/ 1% level.

Although this exercise suggests that financial self-interest are reflected in fairness considerations, the question whether fairness motives have a uniform impact on individual preferences for tax progression over all income groups can only be answered based on multivariate regressions. Thus, we interact the respondents' income with their fairness preferences, assessments and beliefs to check whether fairness considerations affect tax policy preferences differently for high and low income individuals.[185] The results presented in Table 11.8 do not support this view since none of the interaction terms is significant. In specification (1) to (5), a categorial variable indicating the individual monthly net income[186] is interacted with the fairness variables. The results suggest an overall strong income effect but only individual beliefs and the perception of an adequate payment remain significant after the inclusion of the interaction terms. Since the self-serving bias might be more evident among individuals with a very low or high income (as suggested by Table 11.7), we further interact our fairness indicators with two binary variables equal to one for respondents belonging either to the ten percent of the population with the lowest (specifications (6) to (10)) or those with the highest (specifications (11) to (15)) incomes. For these groups fairness considerations have a stronger impact on preferences for tax progression though without a significant difference between income groups (i.e. the interaction effect is not significantly different from zero). Thus, fairness considerations have an independent impact on individual tax rate preferences and are not just an additional channel through which narrow redistributive self-interest drives attitudes toward progressive taxation.

Different income types and incentives of the German tax system

In the preceding analysis individual net income has been our proxy for the immediate financial self-interest. This variable may, however, not be able to fully capture the impact of taxation on one's own available net income. The use of individual incomes, for instance, ignores that the respondent might live in a household and shares resources with other income recipients. Thus, a person who works only part-time but lives in a high income family may be treated as a low income individual though he actually belongs to the upper part of the income distribution. Based

[185] The calculation of interaction effects in non-linear models requires some additional procedures because the marginal effect of an interaction term do not provide reliable information on its size or significance. Moreover, the interaction effect depends on the independent variables and is, hence, observation-specific (Ai and Norton, 2003). We calculate the interactions effects by applying the procedure proposed by Ai and Norton and report average values for the interaction effects and the standard errors.

[186] This variable consists of ten income categories.

on this reasoning, we re-estimate our baseline regressions using the respondent's equivalent net income instead of his individual net income.[187] Table 11.9 reports the results. Equivalent incomes have a weaker impact on the respondents' tax rate preferences than individual incomes. The variable is only marginally significant (and is insignificant if the respondent's fairness assessment is not included) and the size of the marginal effect is rather negligible. Part of the financial self-interest effect now seems to be captured by the respondents' social mobility since individuals who experienced upward mobility tend to be significantly less supportive toward progressive tax systems. The results remain widely robust with respect to the fairness proxies, only some individual characteristics (such as age, being not employed and employment in the public sector) lose significance. Moreover, one proxy for the respondents' level of information, the perceived importance of politics for their life, becomes at least partly significant.

As an additional robustness test, we include dummy variables indicating whether the respondent is married or has own children (see specification 5). However, neither the marital status nor the presence of children seems to be significantly related to individual attitudes toward progressive tax systems. This result is rather surprising since the German tax system allows a joint tax assessment for married individuals and, thus, treats tax payers differently depending on their marital status.

From the perspective of a person who is legally married,[188] the individual income may not capture his self-interest regarding tax progression because the tax payments are determined by the income of both spouses. A person earning a low income, for instance, might not benefit from a progressive taxation if his or her spouse has a well paid job. What is essential, however, is that the inclusion of these dummy variables does not change the key results for fairness-related indicators.

[187] We calculate the equivalent income to adjust the household income by the household size and to take economies of scale in household consumption into account. An intermediate equivalence scale is used and the equivalent income is equal to the monthly net income of the household divided by the square root of the number of household members. The household income variable includes several unrealistically high income observations (outliers). Thus, we have applied a top-coding procedure and replaced all incomes higher than ten times the median income by this value.

[188] For tax purposes the legal marital status of an individual matters. Thus, we distinguish between married (including separated couples) and non-married (i.e. single, divorced and widowed individuals).

Table 11.8: Robustness test: interaction between fairness considerations and income

	Fairness variables interacted with...														
	net income					low net income					high net income				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Income	-0.0233***	-0.0317***	-0.0192**	-0.0275***	-0.0283***	0.087	1.1229	0.0776	0.0979	0.0694	-0.1049**	-0.1103	-0.1147*	-0.1388**	-0.1860***
	(0.0089)	(0.0116)	(0.0096)	(0.0086)	(0.0106)	(0.0822)	(39.6245)	(0.0735)	(0.0714)	(0.0801)	(0.0517)	(0.0695)	(0.0658)	(0.0533)	(0.0690)
Need	0.0741					0.0597**					0.0537*				
	(0.0736)					(0.0277)					(0.0287)				
Need ×	-0.0006					0.0275					0.0882				
Income	(0.0127)					(0.0852)					(0.0978)				
Effort		-0.1537**					-0.0897***					-0.1018***			
		(0.0765)					(0.0306)					(0.0319)			
Effort ×		0.0017					-0.0957					0.019			
Income		(0.0128)					(0.0850)					(0.0978)			
Social Differences			0.0461					-0.0319					-0.0309		
			(0.0766)					(0.0320)					(0.0331)		
Social Differences ×			-0.0124					0.1031					0.0526		
Income			(0.0127)					(0.0847)					(0.0997)		
Ordinary People				-0.1267					-0.0816***					-0.0980***	
				(0.0773)					(0.0297)					(0.0308)	
Ordinary People ×				0.0032					0.1005					0.1588	
Income				(0.0146)					(0.0975)					(0.106)	
Adequate Wage					-0.1303*					-0.1062***					-0.1173***
					(0.0734)					(0.0285)					(0.0295)
Adequate Wage ×					-0.0018					0.1227					0.1631
Income					(0.0129)					(0.0851)					(0.1103)
Pseudo R2	0.1059	0.1066	0.1068	0.1063	0.1061	0.0984	0.1036	0.0994	0.0985	0.0991	0.0979	0.0975	0.0977	0.1009	0.1014

Notes: Probit estimates (reported are average marginal effects). The calculation of reported average interaction effects and the corresponding average standard errors is based on Ai and Norton (2003). */**/*** denotes significance at 10%/ 5%/ 1% level. The income used for the calculation of the interaction effects consist of ten categories indicating the respondents individual net income (NET INCOME, columns (1) to (5)) and dummy variables equal to one if the respondent belongs to the ten percent with the lowest (LOW NET INCOME, columns (6) to (10)) or highest (HIGH NET INCOME, columns (11) to (15)) individual net income. Additional variables (not shown) are those included in the benchmark specification (see Table 11.4, column 4). The regressions are based on 827 observations.

The analysis presented in Table 11.10 addresses this issue by dividing the sample based on the respondents' marital status and analyzing the determinants of tax progression preferences separately for legally married and non-married individuals. The results indicate that for married persons the individual income is significantly related to their attitudes toward progressive taxation. Furthermore, the magnitude and significance of the income effect is not affected by the inclusion of variables, which proxy the income potential of the respondents' partner. Attitudes toward a progressive tax system do not differ between individuals whose partner is employed (either full- or part-time) and those without a working spouse (irrespectively of a person's individual income).

The comparison of the empirical results for the two samples reveals further insights on differences in attitudes toward taxation between married and non-married individuals. The results have to be regarded with caution due to a considerable reduction of the number of observations as a consequence of the sample split. While preferences for the need principle and the perceived situation of ordinary people contribute significantly to the explanation of tax progression preferences among non-married individuals, they do not explain these attitudes among married persons. Beyond that also the effects of effort and the perceived fairness of social differences and of own wages differ between both samples. Though fairness considerations seem to matter for both groups of respondents, the concrete effects of fairness aspects (as well as self-interest) on individual attitudes toward progressive taxation might depend strongly on the group of individuals considered and their life situation. Our main results presented in Table 11.4 should, hence, be interpreted as an average effect for a sample of German voters but must not apply to each single individual or group of individuals.

Although we cannot rule out that omitted variables may drive individual financial self-interest, fairness considerations, level of information and individual characteristics as well as attitudes toward progressive taxation, this analysis points at the relevance of both fairness aspects and narrow redistributive self-interest in determining preferences for different tax schemes.

Table 11.9: Robustness test: equivalent household incomes

	(1)	(2)	(3)	(4)	(5)
Equiv. income/100	-0.0006	-0.0006	-0.0009*	-0.0008*	-0.0009**
	(0.0004)	(0.0004)	(0.0004)	(0.0005)	(0.0005)
Equiv. income^2/10,000	0.0000	0.0000	0.0000*	0.0000*	0.0000*
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Social Mobility	-0.0167**	-0.0130*	-0.0103	-0.0070	-0.0065
	(0.0072)	(0.0073)	(0.0080)	(0.0080)	(0.0080)
Importance Politics	-0.0404*	-0.0418*	-0.0416	-0.0478*	-0.0492*
	(0.0240)	(0.0251)	(0.0269)	(0.0276)	(0.0276)
Secondary Education	0.0174	0.0196	0.0173	0.0251	0.0246
	(0.0283)	(0.0293)	(0.0311)	(0.0314)	(0.0314)
Upper Secondary Education	-0.0055	-0.0068	-0.0345	-0.0307	-0.0293
	(0.0372)	(0.0381)	(0.0408)	(0.0413)	(0.0411)
University	0.0259	0.0078	0.0597	0.0420	0.0381
	(0.0402)	(0.0405)	(0.0435)	(0.0434)	(0.0433)
Age	0.0008	0.0014	0.0020**	0.0029***	0.0028**
	(0.0008)	(0.0009)	(0.0010)	(0.0010)	(0.0011)
Female	0.0243	0.0317	0.0230	0.0316	0.0316
	(0.0224)	(0.0229)	(0.0245)	(0.0248)	(0.0249)
East	0.0154	0.0112	-0.0195	-0.0108	-0.0106
	(0.0225)	(0.0235)	(0.0253)	(0.0261)	(0.0261)
Unemployed	-0.0253	-0.0192	-0.0028	-0.0050	0.0062
	(0.0477)	(0.0492)	(0.0568)	(0.0562)	(0.0571)
Not Employed	0.0245	0.0194	-0.0061	-0.0174	-0.0134
	(0.0304)	(0.0312)	(0.0357)	(0.0362)	(0.0363)
Self-Employed	0.0099	-0.0004	-0.0095	-0.0235	-0.0193
	(0.0444)	(0.0443)	(0.0460)	(0.0453)	(0.0455)
Public Employee	0.0603*	0.0583	0.0504	0.0490	0.0496
	(0.0362)	(0.0363)	(0.0386)	(0.0383)	(0.0382)
Need		0.0586**		0.0547**	0.0529**
		(0.0229)		(0.0247)	(0.0247)
Effort		-0.0993***		-0.0622**	-0.0593**
		(0.0232)		(0.0271)	(0.0271)
Democracy		0.0273		0.0458*	0.0436*
		(0.0233)		(0.0257)	(0.0257)
Social Differences			-0.0718***	-0.0505*	-0.0527*
			(0.0253)	(0.0276)	(0.0276)
Ordinary People			-0.0863***	-0.1004***	-0.1020***
			(0.0267)	(0.0265)	(0.0264)
Adequate Wage			-0.0858***	-0.0866***	-0.0884***
			(0.0250)	(0.0255)	(0.0255)
Married					0.0343
					(0.0303)
Children					-0.0195
					(0.0346)
Pseudo R2	0.0181	0.0429	0.0634	0.0892	0.0910
Observations	1310	1212	1061	1007	1006

Notes: Probit estimates (reported are average marginal effects). */**/*** denotes significance at 10%/ 5%/ 1% level.

Table 11.10: Robustness test: sample split according to marital status

	Married			Single, divorced or widowed		
	(1)	(2)	(3)	(1)	(2)	(3)
Intermed. Income	-0.1362***	-0.1367***		-0.1022*	0.0547	
	(0.0513)	(0.0513)		(0.0592)	(0.1220)	
High Income	-0.2002***	-0.2030***		-0.1836*	-0.1072	
	(0.0667)	(0.0668)		(0.1038)	(0.1764)	
Income			-0.0262**			-0.0037
			(0.0120)			(0.0326)
Social Mobility	0.0145	0.014	0.0146	-0.004	-0.0516*	-0.0555*
	(0.0109)	(0.0109)	(0.0109)	(0.0144)	(0.0259)	(0.0272)
Need	0.0252	0.025	0.0108	0.1035**	0.1656**	0.1615**
	(0.0328)	(0.0328)	(0.0329)	(0.0453)	(0.0761)	(0.0761)
Effort	-0.1149***	-0.1140***	-0.1154***	-0.0818	-0.1191	-0.1157
	(0.0361)	(0.0362)	(0.0364)	(0.0517)	(0.0880)	(0.0862)
Democracy	0.0504	0.0503	0.0577*	0.0603	0.0183	0.0393
	(0.0346)	(0.0345)	(0.0345)	(0.0484)	(0.0872)	(0.0859)
Social Differences	-0.0849**	-0.0873**	-0.0800**	0.0911	0.1274	0.1147
	(0.0362)	(0.0362)	(0.0362)	(0.0562)	(0.0951)	(0.0957)
Ordinary People	-0.0282	-0.0296	-0.0332	-0.1637***	-0.1512*	-0.1457*
	(0.0353)	(0.0353)	(0.0354)	(0.0480)	(0.0804)	(0.0821)
Adequate Wage	-0.1150***	-0.1126***	-0.1069***	-0.0708	0.0476	0.0464
	(0.0344)	(0.0345)	(0.0346)	(0.0479)	(0.0856)	(0.0859)
Importance Politics	-0.0286	-0.0284	-0.0272	-0.0697	-0.1252	-0.1228
	(0.0361)	(0.0361)	(0.0362)	(0.0498)	(0.0912)	(0.0904)
Secondary Education	0.0181	0.0195	0.0201	0.081	0.016	0.039
	(0.0426)	(0.0428)	(0.0426)	(0.0576)	(0.1051)	(0.1056)
Upper Secondary Education	-0.0536	-0.0518	-0.0335	0.0702	0.1281	0.152
	(0.0591)	(0.0593)	(0.0603)	(0.0689)	(0.1260)	(0.1306)
University	-0.006	-0.009	-0.0212	0.0753	-0.0172	-0.0326
	(0.0573)	(0.0578)	(0.0581)	(0.0868)	(0.1356)	(0.1368)
Age	0.0049***	0.0052***	0.0052***	0.0041**	-0.0028	-0.0016
	(0.0017)	(0.0018)	(0.0018)	(0.0020)	(0.0045)	(0.0044)
Female	0.007	0.0062	0.0049	-0.0126	0.0007	0.0006
	(0.0380)	(0.0399)	(0.0395)	(0.0475)	(0.0882)	(0.0911)
East	-0.0046	-0.0049	-0.004	0.007	0.0386	0.0217
	(0.0361)	(0.0361)	(0.0357)	(0.0489)	(0.0939)	(0.0933)
Unemployed	-0.0284	-0.0314	-0.0096	-0.0248	-0.1449	-0.1211
	(0.0790)	(0.0794)	(0.0781)	(0.1141)	(0.2486)	(0.2399)
Not Employed	-0.0919*	-0.085	-0.0987*	-0.0183	0.1225	0.0743
	(0.0518)	(0.0524)	(0.0526)	(0.0894)	(0.2101)	(0.2005)
Self-Employed	0.0968	0.0945	0.1136	-0.1008	-0.0011	-0.0013
	(0.0702)	(0.0701)	(0.0707)	(0.0835)	(0.1178)	(0.1220)
Public Employee	0.0974**	0.0993**	0.1094**	-0.0041	0.0765	0.064
	(0.0489)	(0.0490)	(0.0498)	(0.0702)	(0.1153)	(0.1140)
Partner: part-time worker		0.0515			0.1992	
		(0.0528)			(0.1981)	
Partner: full-time worker		0.0247	0.0541		0.0417	-0.1102
		(0.0407)	(0.0975)		(0.1096)	(0.2413)
Partner: full-time worker ×			-0.0089			0.024
Income			(0.0151)			(0.0437)
Pseudo R2	0.1526	0.1546	0.1546	0.1199	0.1941	0.1853
Observations	525	525	525	301	113	113

Notes: Probit estimates (reported are average marginal effects). */**/*** denotes significance at 10%/ 5%/ 1% level. Income refers to individual net incomes.

11.5 Conclusion

Political-economic approaches explaining the size of the welfare state are usually based on the assumption that individuals solely apply the criterion of their own redistributive gain or loss when they reflect on the preferred system. Thus, an individual's demand for redistribution should largely result from his position in the income distribution. Our findings, however, indicate that an analysis of individual tax preferences that focuses solely on this narrow financial calculus leaves out an important part of the story. Individuals do not only choose the tax system that is most beneficial to their own material advantage but fairness considerations also play an important role. Consequently, even high income individuals may support a tax system where they have to pay a larger share of their income in taxes than low income earners. Especially the fairness preferences, the beliefs on the reasons for inequality and the perceived justice of the status quo distribution contribute to the explanation of individual heterogeneity in attitudes toward progressive taxation.

Our findings are highly relevant when it comes to the actual implementation of tax reforms. To foster voter support for potentially growth-enhancing tax policies (via a lower degree of tax progression), it is important to also address the fairness-related concerns about such a reform. Focusing on fairness aspects seems to be an essential issue for a successful selling of reforms. Especially the perception of decreasing social justice determines the voters' preference for a progressive taxation. Voters might support a greater degree of tax progression because they want to reduce potentially unfair income differences which do not reflect differences in effort. High marginal tax rates may, however, lower individual work incentives. If individuals adjust their behavior the relevance of effort as a determinant of financial success decreases. Hence, the perceived justice of income differences further falls and demand for progressive taxation increases. To overcome this potential vicious circle, politicians could, for instance, stress the relevance of industriousness for economic success as well as the impact of incentives for individual effort. Given our results, the belief that everybody is responsible for his own economic situation would also increase the voters' support for tax reforms which aim at reducing disincentives that result from marginal tax rates increasing in income.

Chapter 12

Labor market policy preferences*

12.1 Introduction

Highly regulated labor markets remain a challenge for many industrialized countries. While demographic change makes a better use of the labor force highly desirable, existing labor market institutions still entail obstacles and disincentives for employment. At the same time, attempts to enact market oriented labor market reforms are regularly confronted with significant political resistance. The German experience in recent years gives an example for the political problems of increasing labor market flexibility: although many of the underlying problems of German labor market had been well known by experts for years, the "Hartz reforms" have only been possible after a dramatic increase of unemployment. And even though these reforms are regarded to contribute to a falling unemployment (Franz, 2006), they remain politically contentious.

In recent years, the contrast between reform needs and observable reform activities - which is not confined to labor market policy - has attracted increasing academic attention. A first strand of the relevant literature explores survey data for typical differences between expert and lay perceptions of economic phenomena and also takes account of psychological insights (Baron and Kemp, 2004; Blendon et al., 1997; Caplan, 2002). A second literature is based on cross-country comparisons and scrutinizes the country or timing specific factors which foster or block reforms (for a survey see chapter 4 in Heinemann et al., 2008). From the latter literature a specific insight emerges with respect to labor market reforms: unlike reforms of financial markets, product markets or foreign trade, no overall trend of market

* This chapter is based on a joint work with Friedrich Heinemann and Ivo Bischoff (see Heinemann et al., 2009).

friendly reforms has been detected for labor markets in industrialized countries over recent decades. On this field, regulation indicators often stay constant or even increase (Helbling et al., 2004). This persistence of regulation makes it desirable to widen our understanding for the individual factors which shape the support for interventionist labor market institutions and policies. Here our contribution comes in: based on survey data we explore the drivers of labor market reform acceptance at the individual level.

Comparable studies have been undertaken for pension reforms (Boeri et al., 2002; Boeri and Tabellini, 2012) indicating that, besides self-interest, information and problem awareness are major drivers of reform acceptance. An important point of reference is the literature on the political economy of labor market regulation starting with the insider-outsider-theory (Lindbeck and Snower, 1988) and advanced in recent years by contributions such as Saint-Paul (2000), Boeri et al. (2004) and Neugart (2008). These authors are particularly interested in understanding the relative political attractiveness of unemployment benefits versus employment protection, given that cross-country evidence indicates that generous unemployment benefits and rigid employment protection rules may be substitutes. Both Saint-Paul and Boeri et al. stress the importance of individual skill levels whereas Neugart draws the attention to the role of voters without labor market activity who depend on within household transfers. While these labor economics approaches focus on self-interest (i.e. a person prefers that labor market policy which guarantees him the highest net gain) as an explanation for sticky labor market institutions. Beyond that, our approach focuses on further explanations for labor market policy preferences such as fairness preferences or the role of beliefs about the role of effort for economic success.

This chapter is organized as follows: in section 12.2 we present the database and our indicators of labor market reform preferences. Section 12.3 is devoted to the theoretical identification of factors that may explain why individuals differ in their views on labor market reforms. We present our econometric results as well as some robustness checks (section 12.4) and offer policy conclusions in section 12.5.

12.2 Labor market preferences of German voters

In this study, we focus on ALLBUS data, which has been collected in the years 2000 and 2006. The year-2006 wave is a particularly valuable source for the assessment of labor market policies as it contains questions defined in the context of the Interna-

tional Social Survey Programme (ISSP). The questions related to the ISSP modules *"Work Orientation II"* and *"Role of Government IV"* include items highly relevant for the acceptance of labor market reforms.[189] The content of the year-2000 wave is less specific on labor markets but offers questions on acceptance of social benefit cuts in general and on redistributive preferences.

This combined data set contains the following items which function as our indicators for the individual preferences on labor market reforms and as dependent variables in the subsequent regressions.[190] Two questions ask for the acceptance of benefit cuts: the one from the year-2000 wave refers to SOCIAL BENEFITS in general, whereas the 2006-wave focuses more specifically on the acceptance of cutting UNEMPLOYMENT BENEFITS. Two further questions from the year-2006 data set are linked to the assessment of interventionist labor market policy, i.e. the support for SUBSIDIES TO DECLINING INDUSTRIES and PUBLIC EMPLOYMENT PROGRAMS.[191] Finally, one question refers to employment protection and asks for the willingness to accept temporary contracts in order to avoid unemployment. It has to be stressed that this latter question is distinct from the others insofar as it does not ask for the assessment of a political approach but for individual behavior. Lacking an alternative measure for the vividly debated point of employment protection, we include it in our analysis. However, analytical results based on this question must be interpreted with caution.

From the point of view of economic experts, the mentioned questions obviously lack precision. Survey respondents can have very different ideas on the particular design of EMPLOYMENT PROGRAMS or SUBSIDIES TO DECLINING INDUSTRIES. The questions on cutting (unemployment) benefits are also far from precise with respect to the specificities of a reform, which includes benefit cuts. In spite of these limitations, the answers nevertheless reveal the individual's tendency to support or reject market-oriented reforms which are based on a less generous welfare state and less government interventions.

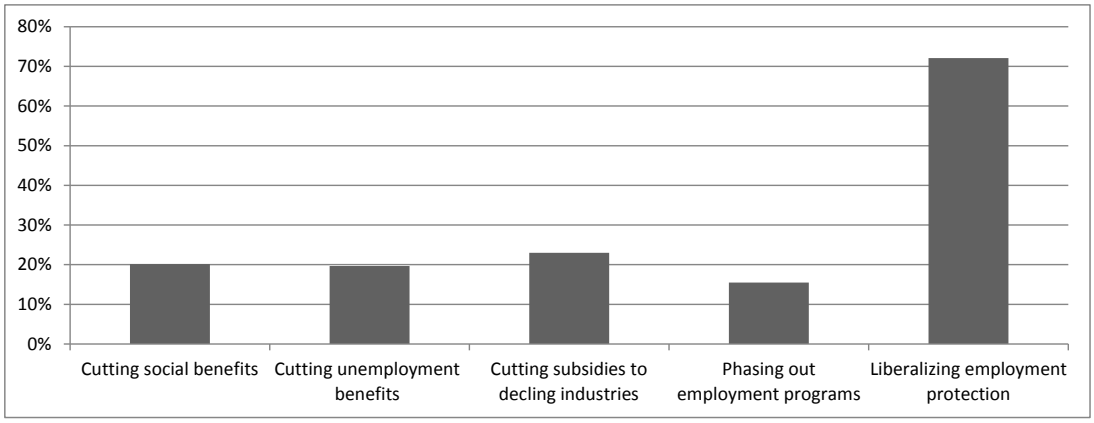
To facilitate the interpretation, all policy preference indicators have been recoded into binary variables that are equal to one if the respondent is in favor of

[189] ALLBUS respondents participate either in the module "Work Orientation III" or "Role of Government IV", thus, data from both modules can only be used separately. This limitation precludes the construction of aggregate indicators of reform acceptance summarizing individual positions over all policy issues.

[190] A detailed description of our variables is offered in Table B.2 in the appendix.

[191] An earlier version of this study (see Heinemann et al., 2009) also covered the support of an increase in the pension age. The acceptance of different pension reform options is, however, analyzed extensively in chapter 13 of this book and is, thus, not further discussed in the context of labor market reforms.

Figure 12.1: Preferences for market oriented labor market policies



liberal reform approaches (i.e. preferring a cut of benefits, supporting a cut of subsidies as well as employment programs and accepting lower standards of employment protection) and zero otherwise.

Figure 12.1 reveals that the vast majority supports interventionist labor market policies and is skeptical on cutting benefits. Thus, the opinions of (economic) experts are far from popular among the German population. The average acceptance of liberalizing reforms ranges only between 16 (phasing out of employment programs) and 22 percent (cutting subsidies to declining industries). The only exception is the acceptance of terminable contracts which is supported by 72 percent. However, the mentioned character of the underlying survey question indicates that this supportive view reflects individual flexibility rather than policy preferences. Note that the rejection rates for cutting social benefits in the year-2000 wave and for cutting unemployment benefits in the year-2006 wave are almost the same. This is remarkable given that in between both years substantial labor market reforms have reduced the generosity of the system.

12.3 Potential determinants of individual labor market policy preferences

Very different factors may explain why individuals diverge in their views on labor market reforms. First, narrow self-interest related to individual gains and losses from a given policy is likely to play a central role, since individuals are affected

differently by reforms depending on their economic situation. Second, individuals have different levels of economically relevant information and entertain diverging economic beliefs on the role of incentives, for example. Both could lead them to different conclusions concerning the effectiveness of labor market reforms. Third, reforms may be judged from a fairness perspective with different ideas of fairness leading to different views on reforms.[192] In this section, we discuss how different proxies for these three (and some other) factors should influence labor market reform acceptance. We pay particular attention to the five reform issues, which are covered by the ALLBUS survey.

Self-interest

The idea that self-interest drives both the support for and resistance against labor market reforms is the central creed of the political-economic view at labor market institutions. According to a highly influential work (Lindbeck and Snower, 1988), insiders (the employed) have an interest in labor market regulations shielding them against wage competition by outsiders (the unemployed). This theory can explain why democracies opt for employment protection even at the costs of raising structural unemployment as long as the median voter is employed. Saint-Paul (2000) advances this basic idea further to explain the stability of rigid labor market institutions. He shows that unskilled workers may demand employment protection at the costs of skilled labor and the unemployed. Boeri et al. (2004) suggests that low skilled workers tend to favor employment protection relative to unemployment benefits and that this holds in particular for countries with a compressed wage structure. Neugart (2008) proposes that voters who are not part of the labor force and depend on transfers from a wage earner within their household are particularly supportive for employment protection (relative to unemployment benefits). These insights are helpful to identify individual characteristics which approximate self-interest in the formation of labor market policy preferences.[193]

[192] The focus on fairness aspects considered in this study is motivated both by data availability and the public debate in Germany after the reforms of the 'Agenda 2010'. Naturally, other factors such as altruism, solidarity or negative external effects from poverty should also contribute to the willingness to support redistribution for individuals who are net payers to the welfare state. Nonetheless, the assessment of the 'Hartz-reforms' in Germany seems to be widely based on the perceived justice of the income distribution.

[193] Due to conceptual and data reasons our analytical approach is different to that of Boeri et al. (2004) and Neugart (2008), who study the relative support of employment protection versus unemployment benefits. Conceptually, we are keen to understand the heterogeneity of views at a much wider range of labor market policy issues including active labor market policies. Apart from that, data limitations preclude a direct comparison of employment protection and

The appropriate identification of self-interest will differ depending on which specific aspect of labor market institutions is at stake. With respect to the level of unemployment benefits we would clearly expect that UNEMPLOYED or those with a particular EXPOSURE TO JOB RISK oppose benefit cuts. Employment risk is related to both job characteristics, e.g. private as opposed to PUBLIC SECTOR employment, and individual risk factors such as low qualification. Hence, all these factors should be negatively correlated with the support for reforms implying a cut in benefits.

Whereas the unemployed and the employed with a significant unemployment risk should entertain similar preferences for high benefits, the insider-outsider theory predicts that both groups differ in their self-interest vis-à-vis measures to protect existing jobs.[194] These measures are not confined to installing employment protection rules but also include market interventions, for instance, through subsidies for declining industries. Because the unemployed do not benefit from this kind of initiatives, we expect support to be confined to workers and in particular to those whose current job is at risk. Public employment programs are less exclusively targeted at job insiders. Therefore, they should be welcome by unemployed and employees alike as long as the latter's job is endangered.

For a number of reasons, the individual INCOME shapes the self-interest in labor market reforms. First, income is a proxy for qualification, which in turn signals job security since unemployment disproportionately threatens workers with low qualification. Second, with increasing income interventionist labor market policies lose their attraction because they become increasingly expensive from the individual perspective due to increasing contributions and taxes. Though unemployment benefits increase with former income in the German benefit system (at least up to the contribution ceiling), this effect does not outweigh the two factors named above. Hence, the higher the income, the more likely it is that the individual is a net payer to the welfare state. Both effects imply the same sign prediction: high income individuals should support liberalization and benefit cuts while opposing expensive subsidies or public employment programs.

Like income, AGE co-determines the self-interest in labor market reforms since older members of the workforce tend to face a lower chance of re-employment if they become unemployed. Thus, they should be more supportive of employment

unemployment benefit preferences for individuals since our preference proxies for these two reform dimensions originate from non-overlapping subsamples of the 2006 ALLBUS data.

194 The overall impact of employment protection on unemployment is ambiguous since its effect is different for employed and unemployed individuals. The protection of existing jobs reduces the flows into unemployment and, hence, protects workers. Employers anticipate this and will hire fewer workers, which lowers the re-employment opportunities of the unemployed.

protection, high unemployment benefit, subsidies for declining industries and public employment programs. As people beyond pension age do not have a strong self-interest in these issues, this impact of age can only be expected for respondents in working age.

ALLBUS allows us to control for the respondents' age, their employment status, their subjective judgement on their unemployment risk and employment in the public sector (see Table B.2 for precise data definitions). Beside income we also make use of a self-employment dummy since entrepreneurs are supposed to be net-contributors to the welfare state.

Information

Information has an impact in the context of economic policy and reform debates. In their analysis of Italian survey data, Boeri and Tabellini (2012) find that respondents who are more informed about the costs and functioning of the pension system are more willing to accept reforms. We expect a similar impact of information also in the context of market-oriented labor market reforms as well-informed and well-educated people should have at least a rough understanding of the functioning of labor markets.

We make use of two variables as proxies of the respondents' degree of information about the consequences of labor market policy reforms: first, we control for education achievements through a dummy for a UNIVERSITY degree. This variable is a combined factor, which approximates not only information but also income prospects and job market risks. Second, the participants' assessment concerning their degree of political information (ALLBUS 2006) or the perceived importance of politics for their everyday life (ALLBUS 2000) is used.

Beliefs

Given that information is generally far from complete, we expect individuals to differ in their economic beliefs. With respect to labor market policies, the belief concerning the impact of incentives on economic effort and the impact of effort on economic success are relevant (e.g. Alesina and Angeletos, 2005; Faravelli, 2007). The belief that individuals are responsible for their own economic situation should lead to a more favorable assessment of reforms targeted at fostering job search incentives such as cuts in unemployment benefits. Similarly, interventionist policies like subsidies for declining industries or employment programs should be less popular among people

who share these beliefs.

Moreover, beliefs on the procedural fairness of the political system may influence policy (reform) preferences. Following the concept of procedural fairness, the question of whether a certain outcome is considered fair, crucially depends on the procedure through which it has been generated (e.g. Anand, 2001; Dolan et al., 2007). We do not have a clear sign prediction for the impact of the procedural beliefs on labor market reform acceptance because the perception of a fair political procedures could legitimize both the existing institutions (e.g. the current level of benefits) and its reforms (e.g. cutting these benefits).

The respondents' beliefs concerning the impact of effort on economic success are captured using dummy-variables indicating whether the respondents believe that income differences increase the incentive for individual effort (ALLBUS 2000) and that *"the future of the people in the East depends on their will to work"* (ALLBUS 2006), respectively. The assessment whether *"politicians are interested in the problems of the ordinary people"* is used as an indicator for the respondents' beliefs about procedural fairness (ALLBUS 2006). For ALLBUS 2000 we exploit information on the participants' beliefs concerning *"the functioning of the democratic system in Germany"*.[195]

Fairness aspects

Labor market policies are an integrative part of welfare state policies and have a substantial impact on the income distribution (compare the first part of this book). Hence, fairness preferences are likely to affect the assessment of labor market reforms. An individual whose concept of fairness is dominated by the need principle (i.e. an income distribution according to individual needs) will have different reform preferences than people whose concept of fairness is dominated by the equity principle (i.e. income distribution should reflect individual effort see e.g. Fong, 2001; Konow, 2003), for example. This individual should be more supportive of high unemployment benefits and interventionist labor market approaches.

Besides fairness preferences, the perceived justice of the status quo distribution may explain different preferences for labor market policies. Individuals who are not content with the fairness of the existing distributive outcomes should be more inclined to support redistributive labor market policies.

[195] The latter is also used in the empirical analysis of voters' attitudes toward tax progression (chapter 11). Since ALLBUS 2006 does not include the corresponding survey question, I use a different indicator for the respondents' belief about procedural fairness.

The preferences for the need principle are measured based on an ALLBUS 2000 question whether the respondent prefers a distributive outcome that guarantees a "decent income even without achievement". No comparable question has been included in the year-2006 survey and, thus, distributive preferences can only be employed to explain the individual assessment of social benefit cuts. The assessed fairness of the social situation is measured using a dummy variable, which equals one if the respondent does not perceive a worsening of the situation of ordinary people (and is zero otherwise).

Personal characteristics

A number of personal characteristics are likely to go along with specific preferences for labor market reforms. Some of these personal characteristics capture specific aspects of financial self-interest, information, beliefs or fairness assessments that cannot be observed directly, while others account for new aspects.

It is by now an established empirical fact that the history of communism has left its marks in behavior and social preferences of Germans who were socialized under that regime. Alesina and Fuchs-Schündeln (2007) show that, compared to their Western German countrymen, East Germans have a stronger preference for redistribution that cannot fully be explained by a narrow redistributive self-interest and the simple fact that East Germans are relatively poor. Bischoff et al. (2008) show that Eastern Germans judge the existing social differences in their country to be less fair than their Western fellow citizens. Following these insights a specific "GDR effect" may also have an impact on reform preferences even if our study design allows to the control for income or job risk. We, thus, expect that socialization under Communism implies a stronger preference for interventionist labor market policies and welfare state generosity.

Religiosity is another personal characteristic of potential importance. Religious people are more likely to believe that it is one's duty to be industrious in the here and now (e.g. Benabou and Tirole, 2006b; Tan, 2006). This may lead them to be skeptical on generous support for the unemployed or activist employment policies. On the other hand, they are likely to exhibit a stronger sensitivity for inequality and other social problems (e.g. Tan, 2006) and perhaps also a moral commitment to help the poor.[196] The net effect of religiosity on the assessment of labor market reforms is, thus, undetermined.

[196] A detailed discussion of the attitude of the church regarding economic freedom is provided in Vaubel (2010).

A complete research design has to take account of gender since the literature reports that women have a stronger preference for income redistribution (e.g. Piper and Schnepf, 2008; Corneo and Grüner, 2002; Delaney and O'Toole, 2008). Moreover, females are compared to males more risk-averse (Meier-Pesti and Penz, 2008) and more sensitive to inequality (e.g. Schlesinger and Heldman, 2001). Therefore, they should be more supportive for a generous unemployment support and interventionist labor market policies.

Based on the reasoning of Neugart (2008) on the role of intra-household transfers for the support of labor market regulation the household composition could matter for the reform readiness: the presumption is that households with members not active on the labor market are particularly interested into the job protection of the household's wage earner.

Again, the ALLBUS dataset offers useful indicators to control for the mentioned impact factors: the impact of socialization under a Communist regime is captured by a dummy which is equal to one if the respondent has either been born (ALLBUS 2000) or spent his youth in the former German Democratic Republic (ALLBUS 2006). Religiosity is assessed by membership in an institutionalized religious community. Besides gender, we also make use of the marital status and dummy for children to proxy the existence of within household transfer dependency.

The descriptive statistics of the variables employed in the subsequent empirical analysis are presented in Table 12.1 and the signs of the expected effects on the different dimensions of labor market reform issues are summarized in Table 12.2.

12.4 Econometric analysis

The subsequent econometric analysis aims at the identification of factors, which explain the individual support for or resistance against market oriented labor market policies. Thus, we regress our labor market policy indicators on a set of explanatory variables introduced in the preceding section. Since the dependent variables are binary, i.e. equal to one if a respondent prefers a market oriented labor market policy and zero otherwise, a probit approach is employed. Basically, we estimate five equations and express the probability that an individual i chooses a particular market oriented policy as a function of his self-interest ($SELF_i$), his level of information ($INFO_i$), his fairness preferences and assessments ($FAIR_i$), his beliefs ($BELIEF_i$) and further individual characteristics (IND_i). Hence, the following

equation is estimated for each of the five labor market policy indicators.

$$Prob(POLICY_i = 1) = \Phi(\beta \cdot IND_i + \delta_1 \cdot SELF_i + \delta_2 \cdot INFO_i + \delta_3 \cdot FAIR_i + \delta_4 \cdot BELIEF_i)$$

Since a major objective of this analysis is to find general patterns in the attitudes toward market friendly labor market policies, Table 12.3 presents the results of all five probit regressions of our policy preference indicators on the set of explanatory variables. We analyze the individual acceptance of reforms concerning preferences on benefits in regressions (1) and (2), interventionist labor market policies in (3) and (4) and employment protection in (5). The slight differences in the inclusion of control variables are caused by the differing availability of indicators in the employed ALLBUS subsets.[197]

Moreover, section 12.4.2 tests the robustness of these general results regarding German voters' labor market policy preferences and the relative importance of the different groups of impact factors. The Tables 12.4 to 12.8, thus, present regression results separately for each policy variable using different specifications. The specification in the first columns includes the respondents' individual characteristics and their level of information. The second columns adds variables capturing individual self-interest. Finally, fairness considerations are taken into account in specifications (4) and (5). This gradual inclusion of the different groups of explanatory factors serves as a robustness test (see also section 11.4.1).

[197] Furthermore, we allowed for general non-linearities for the variables age and income by including also a squared term. The results do not indicate a general non-linear relationship and are, thus, not reported.

Table 12.1: Descriptive statistics

Variable	Mean	Std.Dev.	Obs.
ALLBUS 2000			
Cutting social benefits	0.176	0.381	2874
Age	47.639	17.283	3804
Income	4.923	2.229	2911
Insecure	0.079	0.27	3797
Unemployed	0.067	0.249	3797
Civil servant	0.037	0.189	3797
Self-employed	0.062	0.241	3797
University	0.14	0.347	3757
Politically informed	0.658	0.474	3804
Need	0.496	0.5	3665
Ordinary People	0.75	0.433	3563
Effort	0.604	0.489	3576
Democracy	0.443	0.497	3713
East	0.501	0.5	3804
Religion	0.669	0.471	3778
Female	0.52	0.5	3804
Married	0.607	0.489	3796
Children	0.71	0.454	3804
ALLBUS 2006			
Cutting unemployment benefits	0.181	0.385	1571
Cutting subsidies to declining industries	0.222	0.416	1547
Phasing out employment programs	0.159	0.366	1549
Liberalizing employment protection	0.722	0.448	879
Age	49.332	17.233	3413
Income	1249.878	872.286	2644
Insecure	0.075	0.263	3418
Unemployed	0.079	0.27	3418
Civil servant	0.031	0.173	3418
Self-employed	0.058	0.234	3418
University	0.154	0.361	3381
Politically informed	0.435	0.496	1566
Ordinary people	0.864	0.343	3319
Effort	0.687	0.464	3199
Procedural fairness	0.176	0.381	3275
East	0.378	0.485	3022
Female	0.516	0.5	3421
Religion	0.665	0.472	3404
Married	0.596	0.491	3417
Children	0.723	0.448	3403

Table 12.2: Sign expectations

	Support for (+) / resistance against (-)...			
	Cutting benefits[1]	Cutting subsidies to declining industries	Phasing out employment programs	Liberalising employment protection
Umemployed	-	+	-	+
Job risk	-	-	-	-
Income	+	+	+	+
Age*	-	-	-	
Information	+	+	+	+
Preference: need principle	-			
Principle of distribution				
Belief: self-responsibility	+	+	+	
Belief: functioning democracy	?	?	?	?
Perception: situation ordinary people	-	-	-	-
East Germany	-	-	-	-
Religious	?	?	?	?
Female	-	-	-	-
Children/ Married	?	-	-	-

[1] Applies to unemployment and social benefits.
* Sign of expected age effect is limited to individuals in employment age.

12.4.1 Main results

Our findings regarding the impact factors of general labor market policy preferences are presented in Table 12.3. A first overall insight from the regressions is that individual labor market reform preferences are clearly shaped by self-interest. A larger income is associated with a stronger support for market oriented reforms; only in the case of employment protection preferences the coefficient misses significance.[198] Unemployment increases the resistance against cuts in payments strongly. Similarly, we find that the perception of a high unemployment risk significantly fosters the resistance against unemployment benefit cuts. These results indicate that pecuniary interests are a major impact factor for individual labor market reform preferences. We also find some support for the insider-outsider-theory. As explained in section

[198] To consider a possible impact of personal wealth we also included a dummy-variable equal to one for individuals living in a self-owned house or flat. Since this variable has found to be not significant, the results are not reported.

12.3, the asymmetry of interests between insiders and outsiders should shine up in diverging preferences for subsidies to declining industries, which benefit the protected employees but not the unemployed. Being unemployed is related to a higher probability to support cuts in subsidies to declining industries and the coefficient is marginally significant.[199]

The second essential overall result is that the determinants beyond pure self-interest contribute also to explain individual heterogeneity on labor market policy preferences and that their impact is substantial. Although our information proxies do not show the expected sign in all cases, the willingness of benefit or subsidy cuts tends to be higher for well-informed and well-educated respondents. Surprisingly, having a university degree is related to a lower support of a phasing out of employment programs and those reporting a high political awareness are less inclined to accept a liberalization of employment protection.

Fairness preferences as well as beliefs on the role of individual effort for economic success emerge as further important determinants of the individual assessment of the welfare state: being in favor of a distribution according to the need principle has a highly significant negative impact on the acceptance of benefit cuts, which is the only regression where this particular variable has been available. The belief in individual self-responsibility also matters: it consistently makes cuts of both social benefits in general and unemployment benefits in particular more acceptable. However and unexpectedly, this belief is also connected with less support for liberalized employment protection. Moreover, individuals who trust politicians are more likely to accept a cut of subsidies to declining industries. Beyond that the belief concerning procedural fairness has no significant impact. Note that we did not expect a clear effect based on theoretical considerations since the perception of procedural fairness may make both the status quo and its change more legitimate.

Among the individual characteristics several variables are significant and will be discussed in detail in the subsequent section.

12.4.2 Results for specific labor market policies

Table 12.4 and 12.5 present the findings of the empirical analysis of the individual determinants of preferences for benefit cuts. The significance or sign of the coefficients is - except for the respondents' gender and marital status (social benefits) and children as well as being from East Germany (unemployment benefits) - not

[199] Unfortunately the insider-outsider theory could not be tested for preferences on employment protection since data for this ALLBUS question is only available for employees.

sensitive to choice of the specification.

The empirical analysis points at a strong effect of pecuniary interest for a person's attitudes toward benefit cuts: individuals who are or expect to be net recipients of these benefits oppose their reduction, while net payers (high income recipients) support benefit cuts. Being unemployed reduces the probability of supporting a cut of social (unemployment) benefits by 16 to 18 (12) percentage points. The assessment of a reduction of unemployment benefits is also significantly opposed by persons who fear a job loss and, thus, the reliance on unemployment benefits in the near future. The impact of having an insecure job is with a marginal effect of approximately 15 percentage points also sizable. In addition, self-employed respondents entertain a significantly stronger preference for social but not unemployment benefit cuts, while older respondents are less inclined to support a reduction of benefits for the unemployed.

Table 12.3: Determinants of labor market policy preferences

	Cutting social benefits (1)	Cutting unemployment benefits (2)	Cutting subsidies to declining industries (3)	Phasing out employment programs (4)	Liberalizing employment protection (5)
Self-interest					
Age	-0.0007	-0.0034***	0.0013	0.0003	-0.0040**
	(0.0006)	(0.0008)	(0.0009)	(0.0008)	(0.0018)
Income	0.0139***	0.0001***	0.0001***	0.0001***	0
	(0.0041)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Insecure	-0.0355	-0.1571***	-0.0069	-0.0602	0.0645
	(0.0315)	(0.0499)	(0.0470)	(0.0470)	(0.0557)
Unemployed	-0.1649***	-0.1259**	0.0799*	0.0113	
	(0.0565)	(0.0559)	(0.0479)	(0.0458)	
Civil servant	-0.0544	-0.0766	-0.1242**	-0.0305	-0.0732
	(0.0363)	(0.0591)	(0.0629)	(0.0604)	(0.0743)
Self-employed	0.0979***	-0.03	0.034	-0.0059	-0.0401
	(0.0282)	(0.0475)	(0.0518)	(0.0500)	(0.0611)
Information					
University	0.0544**	-0.0022	0.1109***	-0.0744**	0.0688
	(0.0223)	(0.0340)	(0.0344)	(0.0364)	(0.0554)
Politically informed	-0.0052	-0.0091	0.1019***	0.0357	-0.0638*
	(0.0183)	(0.0242)	(0.0248)	(0.0238)	(0.0373)
Fairness preferences and assessment					
Need	-0.0938***				
	(0.0165)				
Ordinary people	-0.0102	-0.1208***	-0.0155	-0.0475	-0.0355
	(0.0176)	(0.0321)	(0.0371)	(0.0346)	(0.0555)

Continued on next page

Table 12.3 – continued from previous page

	Cutting social benefits	Cutting unemployment benefits	Cutting subsidies to declining industries	Phasing out employment programs	Liberalizing employment protection
	(1)	(2)	(3)	(4)	(5)
Beliefs					
Effort	0.0681***	0.0753***	0.0178	0.0274	-0.0734*
	(0.0172)	(0.0258)	(0.0265)	(0.0250)	(0.0385)
Procedural fairness	0.0116	-0.0153	0.1025***	0.02	0.0803
	(0.0166)	(0.0309)	(0.0319)	(0.0310)	(0.0506)
Individual characteristics					
East	-0.0728***	-0.0368	-0.0602*	0.0027	-0.0141
	(0.0186)	(0.0304)	(0.0329)	(0.0302)	(0.0462)
Religion	0.0626***	0.0306	-0.1216***	-0.0073	-0.0355
	(0.0200)	(0.0293)	(0.0304)	(0.0287)	(0.0437)
Female	-0.007	0.0035	-0.0331	-0.0249	0.0931**
	(0.0177)	(0.0253)	(0.0268)	(0.0252)	(0.0398)
Married	0.0153	0.0002	0.0047	0.0208	-0.0108
	(0.0192)	(0.0274)	(0.0297)	(0.0278)	(0.0424)
Children	-0.0109	-0.0159	-0.0123	-0.0444	0.0096
	(0.0222)	(0.0306)	(0.0336)	(0.0305)	(0.0474)
Regression diagnostics					
Pseudo R2	0.1198	0.1047	0.1281	0.0403	0.0525
Observations	2019	1003	999	997	614

Notes: Probit estimates (reported are average marginal effects). */**/*** denotes significance at 10%/ 5%/ 1% level.

Besides self-interest, the respondents' level of education is significantly related to their attitudes toward social but not unemployment benefits. Respondents with a university degree show a 5 to 8 percentage points higher inclination to support a reduction of social benefit payments.

Fairness aspects further contribute to the explanation of the individual heterogeneity in benefit preferences. On the one hand, the belief that income differences increase work incentives is related to an about 7 percentage points higher likelihood to support lower social or unemployment benefits. On the other hand, persons who prefer a distribution according to the need principle show a 9.4 percentage points lower inclination to agree with social benefit cuts. While the assessment of the situation of ordinary people does not significantly explain support for social benefit cuts, individuals who perceive a worsening of the situation of ordinary people show a 12 percentage points lower probability of supporting a reduction of unemployment transfers.[200] The impact of individual characteristics differs somewhat for the assessment of social and unemployment benefits. The membership in an institutionalized religious community is related to a 6 to 7 percentage points higher probability to support a reduction of social benefits but has no impact on the assessment of unemployment benefits. Persons from the former GDR show a significant lower inclination to support a cut in social benefits, while the stronger resistance of East Germans against lower benefits for the unemployed diminish if fairness considerations are taken into account. This may indicate that different welfare state preferences of East and West Germans reflect at least partly differential fairness motives (a possible explanation for this is offered in chapter 14).

In contrast to the assessment of benefit cuts, pecuniary self-interests are less relevant for individual preferences for policy interventions into labor market. The support for a cut of subsidies to declining industries and a phasing out of employment programs increases in the individual's income and, hence, tax payments. The interest of civil servants in maintaining subsidies might reflect a bureaucratic interest. A further self-interest related factor is the respondents' age as the individual willingness to accept a terminable contract decreases for older persons.

[200] The differences in the impact of the assessed fairness of the situation of ordinary people on preferences for social and unemployment benefits may partly be driven by the inclusion of fairness preferences. The highly significant effect of fairness assessment for unemployment benefits might to some extent also reflect different fairness preferences.

The support for market-oriented reforms depends on the respondents' level of information: individuals with a university degree or those feeling politically informed show an over 10 percentage points greater probability to support a reduction of subsidies. A phasing out of employment programs tends to be supported by politically informed respondents but this effect loses its significance if self-interest factors are included. At the same time, having a university degree lowers the probability of preferring a reduction of expenditures for employment programs by 5 to 7 percentage points. The effect of information on the willingness to accept a less rigid employment protection is also rather mixed.

Unlike their relevance for the individual assessment of benefit cuts, fairness assessments contribute less to the explanation of differences in the attitudes toward market oriented labor market policies. The belief that the future of people in East Germany depends on their will to work is related to a lower likelihood to support liberal employment protection, while the belief concerning procedural fairness corresponds to a greater willingness to accept a terminable contract (though the variable is marginally significant only if the fairness assessment is not included). Moreover, individuals who believe that politicians are interested in the problems of common people show a 10 percentage points higher likelihood of supporting a cut in subsidies than those who do not share this belief.

Among the individual characteristics, East Germans and religious respondents show a lower inclination to support subsidy cuts, while women are more likely to accept a liberalization of employment protection. The latter result must be interpreted with attention to the specific question underlying the dependent variable in regression (5). Since this question targets more at individual labor market flexibility than at a policy position, this gender gap could be related to different employment profiles of men and women on the German labor market.

Table 12.4: Cutting social benefits

	(1)	(2)	(3)	(4)
Self-interest				
Age		-0.0005	-0.0006	-0.0007
		(0.0005)	(0.0005)	(0.0006)
Income		0.0143***	0.0139***	0.0139***
		(0.0039)	(0.0040)	(0.0041)
Insecure		-0.0439	-0.0394	-0.0355
		(0.0303)	(0.0313)	(0.0315)
Unemployed		-0.1780***	-0.1688***	-0.1649***
		(0.0539)	(0.0562)	(0.0565)
Civil servant		-0.0403	-0.0523	-0.0544
		(0.0339)	(0.0348)	(0.0363)
Self-employed		0.1026***	0.0948***	0.0979***
		(0.0273)	(0.0276)	(0.0282)
Fairness preferences and assessment				
Need			-0.0942***	-0.0938***
			(0.0161)	(0.0165)
Ordinary People				-0.0102
				(0.0176)
Beliefs				
Effort			0.0652***	0.0681***
			(0.0167)	(0.0172)
Democracy			0.0066	0.0116
			(0.0162)	(0.0166)
Information				
University	0.0810***	0.0503**	0.0521**	0.0544**
	(0.0181)	(0.0213)	(0.0218)	(0.0223)
Importance Politics	0.0105	0.0133	-0.0023	-0.0052
	(0.0157)	(0.0173)	(0.0181)	(0.0183)
Individual characteristics				
East	-0.1035***	-0.0961***	-0.0760***	-0.0728***
	(0.0157)	(0.0174)	(0.0182)	(0.0186)
Religion	0.0681***	0.0658***	0.0635***	0.0626***
	(0.0175)	(0.0189)	(0.0196)	(0.0200)
Female	-0.0565***	-0.0165	-0.0080	-0.0070
	(0.0141)	(0.0167)	(0.0173)	(0.0177)
Married	0.0265	0.0304*	0.0167	0.0153
	(0.0168)	(0.0183)	(0.0189)	(0.0192)
Children	-0.0227	-0.0201	-0.0106	-0.0109
	(0.0179)	(0.0210)	(0.0218)	(0.0222)
Regression diagnostics				
Pseudo R2	0.0565	0.0949	0.1169	0.1198
Observations	2839	2255	2102	2019

Notes: Probit estimates (reported are average marginal effects). */**/*** denotes significance at 10%/ 5%/ 1% level.

Table 12.5: Cutting unemployment benefits

	(1)	(2)	(3)	(4)
Self-interest				
Age		-0.0031***	-0.0033***	-0.0034***
		(0.0008)	(0.0008)	(0.0008)
Income		0.0001***	0.0001***	0.0001***
		(0.0000)	(0.0000)	(0.0000)
Insecure		-0.1434***	-0.1467***	-0.1571***
		(0.0485)	(0.0490)	(0.0499)
Unemployed		-0.1201**	-0.1196**	-0.1259**
		(0.0552)	(0.0556)	(0.0559)
Civil servant		-0.0782	-0.0757	-0.0766
		(0.0591)	(0.0601)	(0.0591)
Self-employed		-0.0015	-0.0185	-0.0300
		(0.0462)	(0.0483)	(0.0475)
Fairness assessment				
Ordinary people				-0.1208***
				(0.0321)
Beliefs				
Effort			0.0763***	0.0753***
			(0.0259)	(0.0258)
Procedural fairness			0.0199	-0.0153
			(0.0293)	(0.0309)
Information				
University	0.0429	-0.0008	0.0034	-0.0022
	(0.0279)	(0.0330)	(0.0337)	(0.0340)
Politically informed	0.0106	-0.0039	-0.0032	-0.0091
	(0.0216)	(0.0237)	(0.0243)	(0.0242)
Individual characteristics				
East	-0.0931***	-0.0618**	-0.0471	-0.0368
	(0.0272)	(0.0296)	(0.0305)	(0.0304)
Religion	-0.0047	0.0097	0.0177	0.0306
	(0.0272)	(0.0286)	(0.0292)	(0.0293)
Female	-0.0094	0.0045	0.0078	0.0035
	(0.0217)	(0.0247)	(0.0253)	(0.0253)
Married	0.0045	0.0085	0.0028	0.0002
	(0.0248)	(0.0268)	(0.0275)	(0.0274)
Children	-0.0515**	-0.0245	-0.0150	-0.0159
	(0.0260)	(0.0297)	(0.0305)	(0.0306)
Regression diagnostics				
Pseudo R2	0.0221	0.0713	0.0833	0.1047
Observations	1328	1070	1021	1003

Notes: Probit estimates (reported are average marginal effects). */**/*** denotes significance at 10%/ 5%/ 1% level.

Table 12.6: Cutting subsidies to declining industries

	(1)	(2)	(3)	(4)
Self-interest				
Age		0.0010	0.0013	0.0013
		(0.0008)	(0.0009)	(0.0009)
Income		0.0001***	0.0001***	0.0001***
		(0.0000)	(0.0000)	(0.0000)
Insecure		-0.0261	-0.0103	-0.0069
		(0.0462)	(0.0468)	(0.0470)
Unemployed		0.0655	0.0769	0.0799*
		(0.0476)	(0.0479)	(0.0479)
Civil servant		-0.1018*	-0.1226*	-0.1242**
		(0.0609)	(0.0627)	(0.0629)
Self-employed		0.0245	0.0361	0.0340
		(0.0504)	(0.0517)	(0.0518)
Fairness assessment				
Ordinary people				-0.0155
				(0.0371)
Beliefs				
Effort			0.0225	0.0178
			(0.0263)	(0.0265)
Procedural fairness			0.1044***	0.1025***
			(0.0304)	(0.0319)
Information				
University	0.1737***	0.1279***	0.1153***	0.1109***
	(0.0261)	(0.0325)	(0.0335)	(0.0344)
Politically informed	0.1146***	0.1126***	0.1024***	0.1019***
	(0.0215)	(0.0239)	(0.0246)	(0.0248)
Individual characteristics				
East	-0.1041***	-0.0721**	-0.0583*	-0.0602*
	(0.0281)	(0.0315)	(0.0325)	(0.0329)
Female	-0.0904***	-0.0328	-0.0364	-0.0331
	(0.0219)	(0.0258)	(0.0264)	(0.0268)
Married	-0.0173	-0.0020	0.0001	0.0047
	(0.0260)	(0.0285)	(0.0293)	(0.0297)
Religion	-0.1214***	-0.1218***	-0.1261***	-0.1216***
	(0.0274)	(0.0295)	(0.0299)	(0.0304)
Children	0.0229	-0.0073	-0.0059	-0.0123
	(0.0277)	(0.0321)	(0.0331)	(0.0336)
Regression diagnostics				
Pseudo R2	0.0992	0.1219	0.1286	0.1281
Observations	1325	1066	1017	999

Notes: Probit estimates (reported are average marginal effects). */**/*** denotes significance at 10%/ 5%/ 1% level.

Table 12.7: Phasing out employment programs

	(1)	(2)	(3)	(4)
Self-interest				
Age		0.0003	0.0002	0.0003
		(0.0008)	(0.0008)	(0.0008)
Income		0.0001***	0.0000***	0.0001***
		(0.0000)	(0.0000)	(0.0000)
Insecure		-0.0588	-0.0657	-0.0602
		(0.0453)	(0.0467)	(0.0470)
Unemployed		0.0087	0.0075	0.0113
		(0.0456)	(0.0456)	(0.0458)
Civil servant		-0.0185	-0.0297	-0.0305
		(0.0581)	(0.0604)	(0.0604)
Self-employed		-0.0171	0.0010	-0.0059
		(0.0488)	(0.0496)	(0.0500)
Fairness assessment				
Ordinary people				-0.0475
				(0.0346)
Beliefs				
Effort			0.0294	0.0274
			(0.0248)	(0.0250)
Procedural fairness			0.0296	0.0200
			(0.0295)	(0.0310)
Information				
University	0.0087	-0.0581*	-0.0725**	-0.0744**
	(0.0275)	(0.0342)	(0.0355)	(0.0364)
Politically informed	0.0469**	0.0361	0.0347	0.0357
	(0.0207)	(0.0230)	(0.0235)	(0.0238)
Individual characteristics				
East	-0.0514**	-0.0175	-0.0035	0.0027
	(0.0261)	(0.0289)	(0.0298)	(0.0302)
Religion	-0.0218	-0.0151	-0.0119	-0.0073
	(0.0261)	(0.0278)	(0.0283)	(0.0287)
Female	-0.0590***	-0.0219	-0.0251	-0.0249
	(0.0209)	(0.0242)	(0.0248)	(0.0252)
Married	0.0321	0.0253	0.0232	0.0208
	(0.0245)	(0.0267)	(0.0274)	(0.0278)
Children	-0.0217	-0.0489*	-0.0472	-0.0444
	(0.0257)	(0.0291)	(0.0299)	(0.0305)
Regression diagnostics				
Pseudo R2	0.0220	0.0348	0.0376	0.0403
Observations	1324	1066	1016	997

Notes: Probit estimates (reported are average marginal effects). */**/*** denotes significance at 10%/ 5%/ 1% level.

Table 12.8: Liberalizing employment protection

	(1)	(2)	(3)	(4)
Self-interest				
Age		-0.0044**	-0.0044**	-0.0040**
		(0.0017)	(0.0017)	(0.0018)
Income		-0.0000	-0.0000	-0.0000
		(0.0000)	(0.0000)	(0.0000)
Insecure		0.0504	0.0717	0.0645
		(0.0538)	(0.0551)	(0.0557)
Civil servant		-0.0748	-0.0661	-0.0732
		(0.0735)	(0.0737)	(0.0743)
Self-employed		-0.0445	-0.0336	-0.0401
		(0.0605)	(0.0609)	(0.0611)
Fairness assessment				
Ordinary people				-0.0355
				(0.0555)
Beliefs				
Effort			-0.0699*	-0.0734*
			(0.0381)	(0.0385)
Procedural fairness			0.0870*	0.0803
			(0.0485)	(0.0506)
Information				
University	0.0550	0.0925*	0.0757	0.0688
	(0.0438)	(0.0533)	(0.0552)	(0.0554)
Politically informed	-0.0773**	-0.0522	-0.0602	-0.0638*
	(0.0334)	(0.0363)	(0.0369)	(0.0373)
Individual characteristics				
East	0.0227	-0.0014	-0.0090	-0.0141
	(0.0396)	(0.0449)	(0.0458)	(0.0462)
Female	0.0965***	0.0976**	0.0932**	0.0931**
	(0.0316)	(0.0385)	(0.0393)	(0.0398)
Married	-0.0555	-0.0159	-0.0064	-0.0108
	(0.0368)	(0.0413)	(0.0419)	(0.0424)
Religion	0.0041	-0.0249	-0.0301	-0.0355
	(0.0389)	(0.0425)	(0.0433)	(0.0437)
Children	-0.0229	0.0049	-0.0003	0.0096
	(0.0400)	(0.0468)	(0.0469)	(0.0474)
Regression diagnostics				
Pseudo R2	0.0230	0.0412	0.0526	0.0525
Observations	777	648	625	614

Notes: Probit estimates (reported are average marginal effects). */**/*** denotes significance at 10%/ 5%/ 1% level.

12.5 Conclusion

Economists tend to explain labor market reform resistance by referring to approaches that focus predominantly on an individual's financial gain or loss from a particular policy. While our results indicate that this approach has empirical substance and helps to understand individual assessments of different reform dimensions, it leaves out an important part of the story. It is indeed the case that individuals who have high incomes, are young and possess a safe job are more inclined to favor benefit cuts than those in less favorable circumstances. Nevertheless, the resistance against labor market reforms can only partly be explained by a narrow financial self-interest. The findings suggest that voters' positions are also influenced by their informative situation, by their beliefs on the sources of economic success or the functioning of democracy. In Germany, heterogeneity of views is also increased by the split history of the country with East Germans being more supportive toward redistribution than their West German fellow citizens even if individuals from both parts share a similar socioeconomic profile. Our results point to one possible explanation why expert views on labor markets differ so often from lay perceptions: resistance must not necessarily be expected from the reform losers only and it cannot be taken for granted that reform winners will be on the side of liberalizing labor market reforms. Furthermore, our analysis may allow drawing lessons for a successful selling of market oriented labor market reforms: it may not be sufficient to stress the individual advantages of a reform. In addition, policies could also address other sources of reform resistance. For example, the perception that individual labor market is a function of individual effort should be helpful to foster reform acceptance and needs to be communicated.

Finally, our results are important for the possible impact of a macroeconomic shock on the acceptance of market oriented labor market reforms. While the general reform literature is optimistic that crisis fosters the acceptance for reforms (Pitlik and Wirth, 2003), for labor market reforms less optimism is warranted. With a cyclical increase of unemployment an increasing number of voters is faced with the risk of dismissal and will, therefore, have an increasing interest in a comfortable level of unemployment benefits and protection or subsidies from a pure self-interest perspective. Beyond self-interest, a cyclical downturn caused by an external shock such as the global financial crisis has an additional reform impeding effect: the additional unemployment is the clear consequence of an external event not in the responsibility of employees. This may in turn reduce the support for reforms which target at increasing individual effort, for instance, through stronger job search incentives. From

these considerations we would forecast that the financial and economic crisis may complicate market oriented labor market reforms.

Chapter 13

Pension reform preferences*

13.1 Introduction

Adjusting the structures of developed welfare states to population ageing remains one of the key challenges of economic policy in many industrial countries. Notwithstanding these necessities, reform options such as a higher pension age are unpopular among the majority of voters albeit with substantial individual heterogeneity. Preceding studies have explored numerous important drivers of pension reform preferences. According to these insights, an individual's socio-economic characteristics like gender, income or age matter as does the degree of information on the extent of the system imbalances. So far, however, the literature has not looked into another potential source of reform resistance, which is related to an individual's (dis-)utility from work. Hence, this contribution argues that intrinsic motivation, which has received increasing attention on other fields of economic analysis, must not be overlooked in a comprehensive analysis of pension reform preferences. Pension reforms impose or reduce restrictions on ageing citizens to offer their work at the labor market. Therefore, an individual's work motivation should have an impact on reform preferences. People with intrinsic work motivation will be less opposed to longer working years compared to people for whom work is a burden.

To specify the theoretical link between work motivation and pension reform preferences, we regard the optimization on pension age within the framework of an optimal job separation decision. In this context, retirement offers an outside option to the continuation of work and co-determines a reservation wage. If the older worker's job does not pay the reservation wage, the retirement option is more

* This chapter is based on a joint work with Friedrich Heinemann and Marc-Daniel Moessinger (see Heinemann et al., 2013).

attractive. Intrinsically motivated workers will, ceteris paribus, demand a lower reservation wage whereas someone with a large disutility from work will demand a higher compensation for staying in employment. Therefore, a higher pension age should be a relatively attractive reform option for intrinsically motivated workers compared to the reform alternatives of cutting pensions or increasing contributions.

In the empirical part, this prediction is tested for data from the representative ALLBUS survey ("Allgemeine Bevölkerungsumfrage der Sozialwissenschaften": German General Social Survey) of the German population. This test adds to the scarce literature on the drivers of pension reform preferences (surveyed below) in at least two respects. First, it is innovative as it focuses on intrinsic motivation as a potential determinant of reform acceptance. As such, it also advances the intrinsic motivation literature, which, so far, is unrelated to the formation of policy preferences. Second, it does not look at pension reform in general but differentiates between three distinct reform options and their relative popularity: cutting pensions, increasing contributions and lifting the pension age. The results strongly confirm that (lacking) intrinsic work motivation is a robust determinant for individual (resistance to and) support for a higher pension age. A reversed effect is observable with respect to the support for higher pension contributions: intrinsically motivated individuals are less willing than others to pay the price for early retirement through higher contributions.

The chapter is structured as follows: section 13.2 briefly surveys the literature on both the drivers of pension reform preferences and the role of intrinsic motivation in economic contexts. Section 13.3 derives the theoretical expectations to which extent intrinsic work motivation should affect different pension reform options. The data and empirical results are presented in Sections 13.4 and 13.5 followed by robustness checks and conclusions on the feasibility of pension reforms.

13.2 Literature survey

13.2.1 Pension reform preferences

The existing scarce literature on the drivers of pension reform preferences has successfully shed light on some important aspects. Individuals' socio-economic characteristics help to explain variation: the young are more reform oriented than the old; males more than females; the rich more than the poor (Boeri et al., 2002, 2001). The divide between the old and the young generation is a consequence of

the different costs of reforms depending on age. Much of this variation is obviously consistent with a self-interest view on the welfare state along the lines of Meltzer and Richard (1981) where voters judge welfare arrangements on the basis of their individual monetary net balance. Women (due to longer life expectation compared to men), the old (due to their more limited time horizon compared to the young), and the poor (due to the redistributive elements in pay-as-you-go (PAYG) systems and due to a higher unemployment risk compared to the rich) are relative winners of unadjusted PAYG systems. Consistently, all these groups show a relative low inclination to accept reforms which cut back pensions or lift pension age. Scheubel et al. (2009) expand the standard set of self-interest related determinants to the individually expected work ability at pension age and show that this expectation significantly drives the rejection of a higher retirement age.

A further insight from this empirical literature is that, beyond self-interest, information matters. Boeri et al. (2002, 2001) show for a survey of European citizens that the respondents underestimate the costs of the system and have an unrealistic expectation of benefits. The better voters are informed, the more they support reforms which would allow for a partial opting out of mandatory PAYG systems toward private funded schemes. For Italian survey data, Boeri and Tabellini (2012) find that voters are vastly uninformed about the cost and functioning of the pension system and that the degree of information helps to predict an individual's readiness to accept reforms. However, even better information does not guarantee support for sustainability improving reforms. Generally, reforms which cut back the size of PAYG systems lack support, even among those who are informed about an imminent pension crisis (Boeri et al., 2002).

In addition to self-interest and information related factors, the non-economic approaches stress that individual ideological views contribute to shape pension reform preferences. For example, Lynch and Myrskylä (2009) exploit Eurobarometer data to demonstrate that ideological proxies, such as general views on the welfare state or union membership, significantly influence individual positions on pension reforms. In a macro cross-national study, Schneider (2009) confirms that trade union power reduces the likelihood of pension reforms. At the same time, the objective reform need, measured on the basis of projected pension spending increases, speeds up reform activity.

The existing literature is focused on the acceptance of pension reforms in general without paying particular attention to the drivers of relative popularity of different pension reform options. Yet, Boeri et al. (2002) present descriptive evidence for

this relative attractiveness in their two country study. According to these results, a higher pension age is more attractive in Italy than in Germany with the reversed pattern for cutting pensions. None of the existing approaches have, however, included an individual's utility or disutility from work. Thus, the picture remains incomplete.

13.2.2 Intrinsic motivation

The key contribution of the intrinsic motivation literature to economics is its widening of the perspective on incentives. Deci's definition is as follows: "One is said to be intrinsically motivated to perform an activity when one receives no apparent reward except the activity itself" (Deci, 1971, p. 105). Whereas, in particular in the context of principal-agent relationships, neoclassical economics has stressed the role of monetary or other extrinsic incentives, the intrinsic motivation literature extends this view.

One insight of the literature is that monetary incentives or punishments might even be counterproductive as these externally set constraints may crowd out intrinsic motivation (Benabou and Tirole, 2003, 2006b). The empirical evidence is manifold and ranges from experiments, where incentives crowd out reciprocity, over tax honesty, where fines may lead to lower tax morale, up to labor supply decisions, where the introduction of small monetary incentives for voluntary works may reduce supply or labor efficiency (Frey and Jegen, 2001; Frey, 2008). The existence of intrinsic motivation has become important for modern economics' advice on optimum institutions. For instance, the conclusions relate to optimal organizational forms of modern companies with respect to an optimal balance of extrinsic and intrinsic motivation to solve social dilemmas (Osterloh et al., 2002) or to the design of optimal knowledge transfer (Osterloh and Frey, 2000).

Although the relevance of intrinsic motivation has been established in numerous contexts, there is one striking gap: so far, this concept has not been related to the formation of policy preferences. We aim at filling this gap in the context of pension reform preferences - a field particularly promising since it is about government interference with individual freedom of choice to end working life.[201]

[201] For Germany, to which our empirical study applies, working beyond the pension age is legally possible without substantial economic disincentives (there are no cuts in pensions with additional active labor income). However, individual and collective work contracts regularly refer to the official pension age as to the age related contract end. Hence, the pension system's retirement age often imposes a de facto binding constraint on the retirement decision. An economic rationale for employers supporting this mandatory retirement age is given by Lazear's

13.3 Theoretical expectations

Intuitively, there should be a link between pension reform preferences and intrinsic motivation. Somebody who obtains large intrinsic rewards from work should feel less threatened by the prospect of a later pension age compared to somebody working 'just for the money'.

To analyze the impact of intrinsic work motivation on pension reform preferences in a more precise way, it is useful to look at the preferred retirement age in the context of an optimizing job separation decision.[202] The job separation literature assumes that it is optimal for both employers and employees that a worker leaves a firm whenever outside opportunities offer a more productive employment (Mortensen, 1978). Certainly, when reflecting retirement, the outside option is of a different nature and does not relate to the productivity (and wage) which can be achieved with another employer. This reflection, nevertheless, relates to another type of outside option which offers a pension in combination with increased leisure consumption. The combined features of this outside option (including factors such as company pension plans[203], wealth or non-labor income) determine an older worker's reservation wage. Only if labor income for a given age still exceeds the reservation wage associated with the pension outside option, an individual will prefer work over retirement.

Ceteris paribus, workers with a large disutility from work might require a higher reservation wage and have a preference to retire earlier than those with moderate disutility or even positive utility from work. There is considerable evidence that individual retirement decisions are indeed heavily influenced by job satisfaction and working conditions (Blekesaune and Solem, 2005, and the survey therein) so that it appears promising to assume a similar link for the formation of preferences on pension reforms.[204]

However, preference formation on pension reform options is more complex than

famous life cycle- and efficiency wage model (Lazear, 1979).

202 Filer and Honig (2005) suggest this analogy for their analysis of endogenous retirement and (private) pension decisions.

203 Retirement incentive effects of pension plans crucially depend on their construction: defined benefit plans often penalize workers who work beyond the plan's retirement age (Johnson and Steuerle, 2004).

204 The literature, according to which monetary early retirement incentives (e.g. through pension cuts for early retirement, which are too small compared to an actuarially fair cut) are highly effective (see Gruber and Wise, 2004, 2007; Börsch-Supan et al., 2004, 2007), does not falsify the possible impact of intrinsic work motivation on retirement preferences. None of these studies has analyzed to which extent intrinsic work motivation proxies have had a significant impact.

the individual retirement decision. For the latter, it is merely the adjustment to the incentives of an exogenously given pension system. For the former, it is the reasoning on parameter changes which would serve the individual utility best over the (rest of one's) life cycle.

The challenge for a static PAYG pension system which is not adjusted to an increase in longevity is that, in the beginning of a representative insured's life cycle, his present value of received pensions, PVP, exceeds his present value of contributions, PVC, with the implicit individual pension debt, $ID = PVP - PVC$.[205] Thereby, the implicit individual pension debt of a representative individual in age group A depends on the following policy parameters: the retirement age R, the pension contributions C, and the annual pension payments P. Abstracting from growth, income heterogeneity and uncertainty, the individual pension debt is thus denoted by

$$ID_A = PVP_A - PVC_A = \sum_{i=R}^{\infty} Pa_{Ai}\delta^{i-A} - \sum_{i=A}^{R-1} Ca_{Ai}\delta i - A,$$

where a_{Ai} denotes the survival probability of age group A up to age i and δ is the economy's discount factor (see Börsch-Supan, 1992).

Increasing longevity pushes up the survival probabilities a_{Ai} and increases ID_A. This especially holds true for the post-retirement age.[206] A reform which wants to restore sustainability would then have to cut back the sum of all age groups' ID to zero. Basically, this adjustment can occur through any of the three policy parameters (or some of them in combination): increasing pension contributions C, cutting pensions P, or lifting retirement age R.[207]

It is immediately obvious that an individual's age will affect his preference for one of the preferred reform options. A higher C imposes a cost early in the life cycle but not after retirement. Hence, the relative preference for higher contributions

[205] In addition, there is a problem from decreased fertility, which aggravates the mismatch between active workers' contributions and pensioners' benefits. This does, however, not change the subsequent reasoning qualitatively.

[206] The a_{Ai} for younger (pre-retirement) age already are close to one so that the increasing effect of longevity is rather important for PVP than for PVC.

[207] The precise trade-offs between these types of adjustment depend on the parameters of the pension system and demographics. For example, Devesa-Carpio and Devesa-Carpio (2010) show for Spain that, alternatively, a contribution increase by 22%, a decrease of the replacement rate by 14% or a delay of the retirement age by 5% would bring the PAYG pension system back into equilibrium. Furthermore, it should be stressed that an actuarial adjustment of pension benefit to longer working years would not be able to foster the system's sustainability (Breyer and Kifmann, 2002). Later retirement only alleviates the sustainability of PAYG pension schemes if it is not fully compensated through a higher level of pensions.

should increase with age approaching retirement age.[208] A preference for lower pensions should, on the contrary, decline with age approaching retirement. While lower pensions (instead of higher contributions) are relatively attractive for the young with retirement far ahead, they are much less attractive for people close to or in retirement who do not benefit (substantially) from savings in contributions. A higher pension age which effectively cuts back PVP through a later start of pension payments is particularly unattractive for older workers facing retirement.[209] It is relatively attractive for younger workers and even more for pensioners, who are past the critical age to be affected. These age effects have been identified before (see above 13.2.1) and we now concentrate on preference heterogeneity within one age group. For that purpose we regard the relative attraction of cutting P, raising C, or raising R for members of the identical age group A where any of these reforms would cut back ID_A by the same amount ΔID_A.[210]

Our key interest is now how individuals of the same age group and with identical discount factors might differ in their reform options because of differences in intrinsic work motivation. Here it is essential that an identical income effect within one age group (defined by ΔID_A) would translate differently into individual utility. For workers with a high disutility from labor, the higher retirement age will be particular unattractive since it confronts them with a substantial loss in leisure. The assessment is different for those with only low disutility or even utility from work in the sense that they even would prefer unpaid work over sitting at home. For the latter, the longer working lifetime is no loss but utility-enhancing. A higher pension age in these cases may also alleviate a binding constraint, which, so far, has prevented them from working beyond the pension age before the reform. This reform would then simply expand the leeway for self-determination, which again reinforces the importance of intrinsic motivation. Since the latter is particularly powerful in the absence of external restrictions (Frey, 1997b), the reform's impact thus intensifies. Taken together, there is the clear theoretical prediction that - holding all other

[208] Sinn and Übelmesser (2002) define the age dependent population split of supporters and opponents to a cutback of the PAYG system on that basis.

[209] This only holds if older workers are not protected by generous transitory arrangements, as it is the case for the very slow German phasing in of a higher pension age (from 65 to 67), which only becomes fully effective from the year 2029 onwards.

[210] For members of the same age group, heterogeneous individual time preferences can make a difference. Individuals who discount the future more heavily compared to other individuals of the same age group will generally be more inclined to accept costs which materialize in the more distant future, i.e. pension cuts or a higher pension age. In the following, we will abstract from this complication and assume the individual discount rates to be either homogeneous or at least uncorrelated to our key variables of interest.

factors like age or discount rate constant - the reform option of a higher pension age should be relative attractive for those with low work disutility compared to those for whom longer working years is a nuisance.[211]

We would not expect that intrinsic motivation impacts equally positively on the acceptance of lower pension payments or higher pension contributions. Both reform proposals are not associated with any increase in self-determination. Even if intrinsically motivated workers do not work just for the money, they would not welcome new external interventions which cause resistance. It is a central insight of the intrinsic motivation literature that extrinsic incentives can crowd out intrinsic motivation. Extrinsic (typically monetary) incentives which are regarded as inadequate have a destructive effect on work motivation (Frey, 1997a). For example, a cut of net income from active work due to higher pension contributions is likely to be regarded as a move towards an inadequate compensation for work efforts. Given the insights from the mentioned literature, one cannot expect that this move will be more acceptable for workers who enjoy their work compared to those with a larger disutility from working. A similar reasoning applies for cutting pensions. Intrinsically motivated workers could perceive this move as disrespect for their high efforts and react not in a less critical way than other workers.

Thus, the specific difference between workers with a high and low intrinsic work motivation concentrates on the assessment of a higher pension age. While all three reform options (higher contributions, lower benefits, longer working years) confront workers (of the same age group and with equal individual discount rates) with the same income effect, only the longer working years option increases the scope for self-determination and should be the favorite of people who enjoy their work. Hence, our subsequent empirical testing is based on the prediction that intrinsically motivated respondents should have one clear favorite among the reform options, which is a higher pension age.

One qualification, however, could blur the clear prediction on the impact of intrinsic motivation on the reservation wage and reform preferences. It relates to the fact that a wage has to compensate for the disutility of work at the margin (Lazear and Oyer, 2007): it might well be the case that an older worker still receives satisfaction from his work in general but would be glad to have a lower work load or fewer working hours. As a consequence, the wage has to compensate him for

[211] Welfare analyses of pension reform usually assume that the increase of leisure following retirement is as such always utility enhancing (e.g. Lachance, 2008). The existence of intrinsic work motivation points to the possibility that this may not necessarily be the case or, at least, that the utility of pension related leisure may be highly heterogeneous across individuals.

his effort at the margin. If they were free to choose, intrinsically motivated older workers would then stay in employment but possibly reduce their effort or working hours. Regularly, this freedom of choice does not exist so that an employee might not face a decision at the margin but has to reflect whether to stay in employment at all. Only an empirical test can show to which extent this problem invalidates the expectation that intrinsically motivated workers have lower reservation wages and, hence, are more open for late retirement.

Our conceptual framework also allows identifying further essential determinants which should affect pension reform preferences. In principle, all factors which influence an older worker's reservation wage, such as wealth, health or non-labor income, should matter and should, as far as available, be covered as control variables in an empirical approach.

13.4 Data

For our empirical test we use data from the representative ALLBUS survey, which has been conducted from March to August 2006 (Terwey et al., 2007).[212] In Germany, this period was characterized by a large public and parliamentary debate on the future of the pension system, which resulted in the decision to gradually increase the pension age with the relevant law taking effect in 2007.

The ALLBUS data offers all necessary preconditions for testing the impact of intrinsic motivation on pension reform preferences. Besides a rich coverage of socio-economic characteristics, it includes questions on the acceptance of the three basic pension reform options: a higher pension age, higher contributions to the PAYG system and lower pension payments.[213] This specific type of question is particularly useful as it confronts respondents with different reform alternatives, which are equally able to improve the sustainability of the PAYG system. Surveys, which only ask for the acceptance or rejection of one reform option, such as a higher pension age, are confronted with the problem that results could rather reflect general reform willingness than the assessment of the specific reform option (Scheubel et al., 2009).

[212] Most of the data used in this chapter has been collected in the context of the survey module "Work orientation" of the International Social Programme (ISSP).

[213] The precise question is as follows: *"Currently there is a large discussion in Germany about pensions, the financing of pensions and pension age. Below you find three possible measures to solve the problems of the statutory pension system. If you had to decide for one of these, which one would you choose?"* with the three answer options *''To solve the problems of the statutory pension system, the pension age should be increased/ pension contributions should be increased/ the statutory pensions should be cut"*. An overview on all variable definitions is given in the appendix (see Table B.3).

With that ALLBUS question, this is less of a concern and we are able to measure the relative popularity of different reform options independent from the popularity of pension reforms in general.

The survey equally covers a set of questions which can be employed as indicators for the complex of intrinsic work motivation. The survey participants answer the question whether they would like to stay employed even without needing the money earned or whether they are willing to work harder to support the organization. The precise questions run as follows: our LIKE WORK dummy represents the support for the statement *"I would like to work even without need for the money"* and the WORK FOR FIRM dummy marks individuals who declare *"I am ready to work harder than I have to in order to contribute to my firm's/organization's success"*. Both variables are empirically and conceptually distinct. Empirically, the low correlation coefficient (0.13) indicates that respondents perceive the both questions targeting at quite independent issues. Conceptually, the first proxy is clearly much closer to Deci's definition (section 13.2.2) of intrinsic motivation than the second because it is so explicit about working without monetary incentives. The second question is rather related to concepts of organizational commitment. This has different dimensions (Meyer and Allen, 1991) ranging from an affective attachment to an organization over perceived costs of leaving an organization up to normative obligations to remain with the organization. Our question is closest to the measurement of affective attachment, which typically includes items like ours on the willingness to exert effort. In the empirical test we include this measure for a cross-check: from a theoretical point of view, we would expect the measure of intrinsic motivation to have a clearer impact on the pension age preference compared to the organizational commitment proxy. Hence, contrasting both measures' results helps us to assess whether it is really the intrinsic work motivation and not some type of company related affection which drives the results for pension age preferences.

The descriptive statistics (Table 13.1) confirm the finding from other studies that a higher pension age is not a popular solution. If they had to accept one reform, the survey respondents would rather opt for higher contributions. The least popular reform is, however, cutting pensions. According to our intrinsic motivation proxies, around two thirds classify as intrinsically motivated in the sense that they do not work primarily for the money. About one third is ready to work hard for their firm to improve the company's success.

Table 13.1: Descriptive statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
Pension reform preferences					
Increase pension age	1295	0.2672	0.4427	0	1
Higher contributions	1295	0.5606	0.4965	0	1
Cutting pensions	1295	0.1722	0.3777	0	1
Controls					
Age < 25	1293	0.1036	0.3049	0	1
Age ≥ 25, < 45	1293	0.3434	0.4750	0	1
Age ≥ 45, < 65	1293	0.3372	0.4729	0	1
Age ≥ 65	1293	0.2158	0.4115	0	1
Youth in East	1142	0.3853	0.4869	0	1
Member of union	1293	0.1237	0.3294	0	1
Policy interest	1293	0.3016	0.4591	0	1
Female	1295	0.5058	0.5002	0	1
Job insecure	1295	0.0718	0.2583	0	1
University	1284	0.1550	0.3620	0	1
Unemployed	1295	0.0819	0.2742	0	1
Not employed	1295	0.5012	0.5002	0	1
Sick	1295	0.1560	0.3630	0	1
Married	1295	0.5714	0.4951	0	1
Civil servant	1295	0.0347	0.1832	0	1
Entrepreneur	1295	0.0533	0.2247	0	1
Proxies intrinsic motivation and organizational commitment					
Like work	1219	0.6957	0.4603	0	1
Work for firm	1295	0.3629	0.4810	0	1

13.5 Econometric analysis

In a first step, we model the formation of reform preferences as an independent decision problem over acceptance or rejection of each single option under consideration. Hence, our dependent variable is binary (one: support for the specific reform option, zero: no support) and we apply a probit estimation procedure for each of the three policy options (INCREASE PENSION AGE, HIGHER CONTRIBUTIONS, CUTTING PENSIONS). In the next step, we proceed to a multinomial logit modelling, which allows identifying the drivers of relative probabilities between the available reform options.

The inclusion of control variables is guided by our theoretical reasoning. The po-

sition in the life cycle should be reflected in pension reform preferences as explained in the preceding section. Hence, we include different age class dummies (<25, 25-44, and 45-64 years with the pensioner age class 65 and older as our point of reference). Furthermore, we account for individual characteristics which should affect the reservation wage required to opt for longer working years instead of retirement. Among these indicators, we include the fear of a job loss (JOB INSECURE), the employment status (UNEMPLOYED and NOT EMPLOYED)[214] and sickness. All these factors should push up the reservation wage necessary for individuals to work in a higher age and, thus, render an early pension as highly desirable. Given the importance of information for pension reform acceptance (compare the literature survey in Section 13.2.1), we include an information proxy based on the respondent's self-assessment (respondent claims that he is interested in politics in general). The dummy for university education is an integrated proxy for different facets: the degree of information, job satisfaction, but also accumulated wealth - at least the latter two factors should lower the required reservation wage and lead to a relatively favorable position on a higher pension age. We also add control variables which are normally used for modelling policy preferences, e.g. in the context of redistribution (YOUTH IN EAST and UNION MEMBERSHIP). Finally, we supplement standard socio-economic (FEMALE, MARRIED) and employment related indicators (ENTREPRENEUR, CIVIL SERVANT).[215]

Tables 13.2 to 13.4 present the probit estimation results. For each of the policy options the baseline specification including the explained controls is estimated. We then add two specifications including the proposed intrinsic motivation indicator and its cross-check indicator on organizational commitment consecutively.

With respect to the general controls, the included proxies - if significant - confirm our expectations. Table 13.2 indicates that active workers are less willing to accept a higher pension age compared to those who already receive pensions (the respondents aged 65 and above are the reference group, which is dropped in the regression). Conversely, the working age cohorts are more inclined to cut pension payments than today's pensioners (see Table 13.4). Interestingly, these effects appear to be stronger for the middle aged than for the very young.

[214] We distinguish between people who are currently unemployed and people not working due to other reasons such as maternity, education or disability.

[215] ALLBUS also includes an income variable, which, however, suffers from numerous missing values. An inclusion did not change any of the central results but came at the price of a serious loss in observations. Theory would also point to the importance of wealth proxies for older age reservation wages. Suitable wealth indicators, however, are not available in the ALLBUS survey.

Table 13.2: Preferences for a higher pension age

	(1)	(2)	(3)
Age $<$ 25	-0.0423	-0.0457	-0.0521
	(0.0551)	(0.0568)	(0.0556)
25 $\geq$ Age $<$ 45	-0.0998**	-0.0946**	-0.1104**
	(0.0443)	(0.0453)	(0.0449)
45 $\geq$ Age $<$ 65	-0.0612	-0.0665	-0.0666
	(0.0407)	(0.0420)	(0.0408)
Youth in East	-0.1243***	-0.1268***	-0.1260***
	(0.0265)	(0.0270)	(0.0265)
Union Member	0.0306	0.0370	0.0296
	(0.0381)	(0.0386)	(0.0381)
Interested in Politics	0.1053***	0.0966***	0.1029***
	(0.0275)	(0.0281)	(0.0276)
Female	0.0155	0.0060	0.0151
	(0.0265)	(0.0270)	(0.0265)
Job insecurity	-0.0675	-0.0536	-0.0611
	(0.0604)	(0.0597)	(0.0606)
University	0.1090***	0.1168***	0.1096***
	(0.0348)	(0.0353)	(0.0349)
Unemployed	-0.0003	-0.0036	0.0057
	(0.0547)	(0.0569)	(0.0548)
Not Employed	0.0578	0.0715*	0.0805**
	(0.0361)	(0.0364)	(0.0398)
Sick	-0.0765**	-0.0991**	-0.0749*
	(0.0382)	(0.0395)	(0.0382)
Married	0.0272	0.0287	0.0257
	(0.0280)	(0.0290)	(0.0280)
Civil Servant	-0.0618	-0.0864	-0.0593
	(0.0709)	(0.0715)	(0.0710)
Entrepreneur	0.0909	0.0917	0.0854
	(0.0565)	(0.0566)	(0.0566)
Intrinsic motivation and organizational commitment			
Like work		0.0785***	
		(0.0296)	
Work for firm			0.0460
			(0.0340)
Pseudo R2	0.0660	0.0740	0.0674
Observations	1127	1068	1127

Notes: Probit estimations (reported are average marginal effects). */ **/ *** denotes significance at 10%/ 5%/ 1% level.

Table 13.3: Preferences for higher contributions

	(1)	(2)	(3)
Age $<$ 25	0.0074	0.0284	-0.0037
	(0.0641)	(0.0666)	(0.0645)
25 $\geq$ Age $<$ 45	-0.0439	-0.0389	-0.0552
	(0.0519)	(0.0537)	(0.0524)
45 $\geq$ Age $<$ 65	-0.0213	-0.0101	-0.0277
	(0.0481)	(0.0502)	(0.0482)
Youth in East	0.0773**	0.0731**	0.0754**
	(0.0299)	(0.0308)	(0.0299)
Union Member	-0.0555	-0.0497	-0.0560
	(0.0437)	(0.0447)	(0.0437)
Interested in Politics	-0.0964***	-0.0857**	-0.0994***
	(0.0326)	(0.0336)	(0.0326)
Female	0.0365	0.0423	0.0354
	(0.0300)	(0.0308)	(0.0300)
Job insecurity	0.0898	0.0803	0.0976
	(0.0617)	(0.0619)	(0.0620)
University	-0.1090**	-0.1234***	-0.1086**
	(0.0422)	(0.0435)	(0.0421)
Unemployed	-0.0159	-0.0320	-0.0098
	(0.0613)	(0.0639)	(0.0614)
Not Employed	-0.0279	-0.0300	-0.0023
	(0.0414)	(0.0422)	(0.0452)
Sick	0.1225***	0.1426***	0.1237***
	(0.0432)	(0.0446)	(0.0431)
Married	-0.0109	-0.0075	-0.0123
	(0.0319)	(0.0332)	(0.0319)
Civil Servant	0.0679	0.0910	0.0718
	(0.0805)	(0.0812)	(0.0804)
Entrepreneur	-0.1452**	-0.1506**	-0.1527**
	(0.0677)	(0.0692)	(0.0678)
Intrinsic motivation and organizational commitment			
Like work		-0.0648*	
		(0.0335)	
Work for firm			0.0532
			(0.0376)
Pseudo R2	0.0391	0.0435	0.0404
Observations	1127	1068	1127

Notes: Probit estimations (reported are average marginal effects). */ **/ *** denotes significance at 10%/ 5%/ 1% level.

Table 13.4: Preferences for pension cuts

	(1)	(2)	(3)
Age < 25	0.0699	0.0442	0.0858
	(0.0541)	(0.0574)	(0.0539)
25 ≥ Age < 45	0.1676***	0.1551***	0.1834***
	(0.0437)	(0.0460)	(0.0437)
45 ≥ Age < 65	0.1176***	0.1084**	0.1268***
	(0.0418)	(0.0443)	(0.0415)
Youth in East	0.0440*	0.0505**	0.0474**
	(0.0228)	(0.0236)	(0.0227)
Union Member	0.0283	0.0161	0.0284
	(0.0321)	(0.0337)	(0.0320)
Interested in Politics	-0.0119	-0.0116	-0.0060
	(0.0253)	(0.0264)	(0.0253)
Female	-0.0462**	-0.0416*	-0.0438*
	(0.0229)	(0.0239)	(0.0228)
Job insecurity	-0.0402	-0.0416	-0.0523
	(0.0447)	(0.0458)	(0.0451)
University	-0.0031	-0.0021	-0.0029
	(0.0327)	(0.0340)	(0.0324)
Unemployed	0.0171	0.0371	0.0081
	(0.0463)	(0.0486)	(0.0459)
Not Employed	-0.0335	-0.0477	-0.0694**
	(0.0314)	(0.0329)	(0.0334)
Sick	-0.0480	-0.0446	-0.0498
	(0.0363)	(0.0377)	(0.0360)
Married	-0.0158	-0.0224	-0.0139
	(0.0243)	(0.0255)	(0.0241)
Civil Servant	-0.0096	-0.0077	-0.0157
	(0.0573)	(0.0587)	(0.0572)
Entrepreneur	0.0363	0.0408	0.0513
	(0.0469)	(0.0485)	(0.0467)
Intrinsic motivation and organizational commitment			
Like work		-0.0081	
		(0.0261)	
Work for firm			-0.0801***
			(0.0268)
Pseudo R2	0.0515	0.0513	0.0601
Observations	1127	1068	1127

Notes: Probit estimations (reported are average marginal effects). */ **/ *** denotes significance at 10%/ 5%/ 1% level.

Among the other controls, YOUTH IN EAST, POLICY INTEREST, UNIVERSITY and SICK all prove to be significant in most specifications (apart from cutting pension estimations). The signs are as expected: the sick, those with youth in the East, without particular interest in politics or without university education are less ready to opt for a higher pension age, but prefer higher contributions instead. The self-employed differ significantly only with respect to the contribution preference where they reject higher contributions. Compared to men, women are more critical of cutting pensions.

The augmentation of the baselines by our intrinsic work motivation and commitment proxies leads to significant but distinct results for the LIKE WORK and the WORK FOR FIRM dummy. The impact of intrinsic motivation is as expected: Respondents who would prefer work over leisure even without need for the money have a higher probability to support a higher pension age. They are also less likely to opt for higher contributions. The marginal effect allows quantifying the effect: the probability that a respondent opts for a higher pension age is 7.85 percentage points higher if this person is intrinsically motivated. The proxy for organizational commitment "work for firm", however, has a smaller impact (4.6 percentage points) on the pension age preference and fails to be significant at conventional levels. It only shows significance for the cutting pension preference where organizational commitment is associated with a stronger rejection of lower pension. These results confirm our theoretical prediction on the specific impact of intrinsic motivation (compared to concepts of company affection), which has indeed a particularly marked impact on the pension age preference.

A limitation of the binary approach is that the resulting separate regressions for each of the three single reform options do not allow for the cross-equation links. This implies inefficient testing given that, by construction of the pension reform question in the ALLBUS survey, the answers are dependent. Hence, a multinomial logit is a more efficient estimation approach. This procedure allows estimating the impact of covariates on the relative probabilities of an individual choosing one of two options. Since the pension reform preference variable has three values, it implies the joint estimation of two equations. Table 13.5 present the results. The base outcome is the increase of pension age. The relative risk representation is chosen; i.e. the coefficients represent a covariate's impact on the relative probability or risk that a reform options is preferred over the reference outcome of an increasing pension age.

Table 13.5: Preferences for different pension reform options

	higher contributions (1)	pension cuts (2)	higher contributions (3)	pension cuts (4)	higher contributions (5)	pension cuts (6)
Age < 25	1.1725	2.0104	1.2537	1.7491	1.207	2.3095*
	(0.3726)	(0.9749)	(0.4194)	(0.8857)	(0.3877)	(1.1251)
25 ≥ Age < 45	1.3731	4.5571***	1.3872	4.1020***	1.4191	5.2716***
	(0.3529)	(1.7935)	(0.3733)	(1.6745)	(0.3713)	(2.0974)
45 ≥ Age < 65	1.2117	2.9295***	1.2864	2.8155***	1.2307	3.1601***
	(0.2818)	(1.0937)	(0.3174)	(1.0982)	(0.2884)	(1.1806)
Youth in East	1.9956***	2.2556***	2.0328***	2.3799***	2.0122***	2.3300***
	(0.3228)	(0.4631)	(0.3438)	(0.5030)	(0.3263)	(0.4814)
Union Member	0.7974	1.0269	0.7843	0.929	0.7971	1.0423
	(0.1781)	(0.2842)	(0.1816)	(0.2668)	(0.1779)	(0.2897)
Interested in Politics	0.5484***	0.6150**	0.5748***	0.6300**	0.5507***	0.6431**
	(0.0892)	(0.1321)	(0.0975)	(0.1393)	(0.0897)	(0.1388)
Female	1.0107	0.7139*	1.0525	0.7652	1.0089	0.7214
	(0.1560)	(0.1443)	(0.1693)	(0.1592)	(0.1559)	(0.1460)
Job insecurity	1.6288	1.1463	1.519	1.079	1.6005	1.0317
	(0.6107)	(0.5132)	(0.5735)	(0.4852)	(0.6015)	(0.4666)
University	0.5225***	0.6601	0.4860***	0.6384	0.5203***	0.6584
	(0.1071)	(0.1761)	(0.1039)	(0.1746)	(0.1068)	(0.1762)
Unemployed	1	1.1784	0.9756	1.319	0.9833	1.0862
	(0.3248)	(0.4817)	(0.3393)	(0.5652)	(0.3204)	(0.4458)
Not Employed	0.7407	0.6413	0.6992*	0.5594**	0.6963	0.4624**
	(0.1563)	(0.1773)	(0.1520)	(0.1598)	(0.1637)	(0.1393)
Sick	1.6562**	0.9847	1.9256***	1.1456	1.6504**	0.9525
	(0.3673)	(0.3233)	(0.4582)	(0.3896)	(0.3664)	(0.3136)
Married	0.8762	0.8155	0.8772	0.7829	0.8817	0.8277
	(0.1446)	(0.1731)	(0.1538)	(0.1726)	(0.1458)	(0.1761)
Civil Servant	1.434	1.161	1.6761	1.3134	1.4414	1.0966
	(0.5900)	(0.5791)	(0.7116)	(0.6697)	(0.5945)	(0.5529)
Entrepreneur	0.4997**	0.8311	0.4891**	0.8461	0.5043**	0.9351
	(0.1704)	(0.3195)	(0.1724)	(0.3298)	(0.1724)	(0.3620)
	Intrinsic motivation and organizational commitment					
Like work			0.6434**	0.6774*		
			(0.1152)	(0.1564)		
Work for firm					0.8864	0.4979***
					(0.1803)	(0.1227)
Pseudo R-Square	0.0609		0.0654		0.0654	
chi2	133.6748		136.3135		143.5965	
p	0		0		0	

Notes: Multinominal logit estimations (reported is the effect of the variables on the probability that the respective reform option is preferred to an increase in the pension age). */ **/ *** denote the significance at the 10%/ 5%/ 1% level.

Hence, the relative risk ratios reported in Tables 13.5 and 13.7 differs from that of regression coefficients. If the relative risk ratio of a variable is smaller (greater) than one, then this variable raises (lowers) the probability that a person prefers an increase in the pension age over higher contributions or pension cuts.[216] The baseline is followed by specifications augmented by each of the motivation proxies consecutively.

The results for the multinomial logit estimations show some differences to the probit results. Generally, a more critical screening is required since less control variables keep their significance. For instance, the gender variable loses its significance if the motivation dummies are included. The age effects are confirmed: active workers are much more likely to opt for lower pensions than for a higher pension age (factor 4.6 for the 25-44 age group). An absent university education, a youth in the East and no particular interest in politics are robustly significant and foster a rejection of higher pension ages relative to the other solutions.

Both our indicator for intrinsic motivation and the indicator for organizational commitment survive the multinomial testing. As for the probit analysis, the LIKE WORK and the WORK FOR FIRM proxies turn out to have a significant but distinct effect. The predicted probabilities in Table 13.6 report the size of the effect.

Table 13.6: Predicted probabilities for intrinsic motivation and organizational commitment

		Reform preference		
		Increase pension age	Higher contributions	Cutting pensions
Like work	0	0.1885	0.6389	0.1727
	1	0.2630	0.5737	0.1633
Work for firm	0	0.2303	0.5780	0.1917
	1	0.2748	0.6113	0.1139

These predictions are calculated for average values of all other covariates and show the difference between probabilities for respondents who are and those who are not intrinsically motivated. For those who would work even without the need for the money earned, the crucial difference is related to a higher probability of opting for higher pension age and a lower probability of opting for higher contributions. No

[216] The reported ratios are obtained by exponentiating the coefficients of the multinominal logit model. The relative risk ratios indicate how a change in the variable in question affects the probability (or risk) that the outcome falls into the comparison group (i.e. preferring higher contributions or pension cuts) compared to the probability that the outcome falls into the reference group (i.e. preferring an increase in pension age).

marked difference exists for the cutting pension preference. For the organizational commitment motivation proxy WORK FOR FIRM, a particular marked difference exists for the cutting pension preference. Those who feel a large loyalty to their firm or organization are less likely to opt for lower pensions whereas variation in organizational commitment is not associated with a large variation in the pension age preferences.

13.6 Robustness of the results

Our findings support the empirical relevance of the preceding theoretical reasoning: Respondents with a high degree of intrinsic work motivation are more likely to opt for a postponement of the statutory retirement age. However, this result may equally reflect other links in the data structure. Although we already control for numerous important individual characteristics, missing variables could distort the regression. Thus, it cannot be ruled out that intrinsic motivation is linked to a general individual inclination for reform. Furthermore, there is a straightforward alternative story which could explain our key result: it could simply be the case that workers with a physically demanding job are both less intrinsically motivated and, naturally, less optimistic that they would be capable of continuing to work at a higher age (Scheubel et al., 2009). In this case, our result would reflect the impact of job characteristics related to physical stress. In the following, we check for the reliability of our results with respect to these possible objections and also provide several regression variants to check for the general robustness of our findings. In these robustness checks, we now concentrate on our intrinsic motivation proxy LIKE WORK (robustness checks for the organizational commitment proxy WORK FOR FIRM did not leave to any substantial modifications of the above insights and are, thus, not reported).

13.6.1 Physical job stress

With respect to physical job stress, some of our standard control variables already have a proxy characteristic in this regard, such as gender, the education variable (UNIVERSITY) or the profession dummies (CIVIL SERVANT, ENTREPRENEUR). In addition, we experiment with the following more direct control variables: (1) a dummy HARD WORK which indicates that the respondent has to perform a physical straining job and (2) a dummy variable equal one if the respondent is a BLUE COLLAR worker. These additional controls should filter out intrinsic motivation

as far as it is systematically linked to job characteristics. All robustness checks are performed for both the probit (not reported) and the multinomial regressions (reported). Neither of the included variables seem to have any significant impact on pension reform preferences in the multinomial logit regression, while the significant impact of intrinsic motivation persists in all regressions (see Table 13.7).

13.6.2 Ideology, children, and age

The debate on several reform proposals on the German public pension system was strongly affected by party and ideological considerations. To account for the possibility that an individual's choice for a certain reform option reflects his party preference or ideology, we control for the respondent's ideology by making use of a dummy variable indicating that he has classified himself as left-leaning. If, for instance, right-leaning individuals show a higher degree of intrinsic motivation and are also more in favor of longer working years, this would also explain our results. The inclusion does not change the substance of the results (these variants and the following ones are included in Table 13.7).

Having children might also affect a person's readiness to accept certain pension reforms as it might be less desirable to impose the burden of an unsustainable system on future generations. Thus, it is reasonable to expect that individual's with children might be, for instance, less in favor of higher contributions than those without children. We include a dummy variable whether there are children at all. Including this variable, however, does not change the results.

Age is an important determinant of preferences for different reform options of the pension system as it reflects individual self-interest. Therefore, we employ numerous specification changes with respect to the measurement of the age effect (results are not reported but available upon request). First, we change the age classification by introducing closer age groups (10-year intervals). Second, we control for a non-linear relationship by employing the respondent's age as well as its square and cube. The results remain unchanged, indicating a robust and significant age effect, i.e. younger individuals are more likely to accept pension cuts. The significant impact of intrinsic motivation on the reform preferences persists.

Table 13.7: Robustness test: alternative explanations

	higher contributions	pension cuts	higher contributions	pension cuts	higher contributions	pension cuts	higher contributions	pension cuts	higher contributions	pension cuts
Age < 25	1.4441	2.1034	1.2668	1.6967	1.261	1.7627	1.1977	1.668	1.2517	1.7053
	(0.5061)	(1.0992)	(0.4244)	(0.8626)	(0.4219)	(0.8929)	(0.4113)	(0.8610)	(0.4189)	(0.8655)
25 ≥ Age < 45	1.4293	4.2745***	1.3802	4.1491***	1.3968	4.1385***	1.2679	4.0102***	1.4944	3.7662***
	(0.3861)	(1.7503)	(0.3718)	(1.6970)	(0.3762)	(1.6909)	(0.3496)	(1.6561)	(0.4085)	(1.5573)
45 ≥ Age < 65	1.288	2.8323***	1.2793	2.8573***	1.2925	2.8309***	1.1921	2.6760**	1.3446	2.6653**
	(0.3179)	(1.1050)	(0.3161)	(1.1155)	(0.3193)	(1.1047)	(0.3006)	(1.0544)	(0.3341)	(1.0488)
Youth in East	1.9965***	2.3135***	2.0253***	2.4032***	2.0348***	2.3812***	2.0873***	2.4180***	2.0549***	2.3405***
	(0.3387)	(0.4917)	(0.3430)	(0.5089)	(0.3442)	(0.5035)	(0.3597)	(0.5197)	(0.3479)	(0.4952)
Union Member	0.7857	0.9275	0.7794	0.9526	0.7812	0.9243	0.7644	0.8454	0.7857	0.9211
	(0.1820)	(0.2668)	(0.1811)	(0.2743)	(0.1808)	(0.2655)	(0.1792)	(0.2477)	(0.1821)	(0.2650)
Interested in Politics	0.5743***	0.6289**	0.5771***	0.6198**	0.5751***	0.6303**	0.5888***	0.6660*	0.5789***	0.6196**
	(0.0975)	(0.1392)	(0.0981)	(0.1375)	(0.0975)	(0.1394)	(0.1012)	(0.1485)	(0.0983)	(0.1374)
Female	1.028	0.7385	1.0724	0.7224	1.0476	0.7598	1.0638	0.7409	1.0584	0.7608
	(0.1663)	(0.1550)	(0.1771)	(0.1547)	(0.1687)	(0.1583)	(0.1745)	(0.1573)	(0.1705)	(0.1586)
Job insecurity	1.5025	1.0683	1.4921	1.1391	1.5526	1.1198	1.556	1.1996	1.4607	1.0954
	(0.5674)	(0.4804)	(0.5673)	(0.5159)	(0.5890)	(0.5066)	(0.6180)	(0.5570)	(0.5531)	(0.4941)
University	0.4888***	0.6439	0.4941***	0.6073*	0.4742***	0.6128*	0.4573***	0.6214*	0.4936***	0.6273*
	(0.1045)	(0.1764)	(0.1071)	(0.1686)	(0.1033)	(0.1711)	(0.0997)	(0.1714)	(0.1057)	(0.1722)
Unemployed	1.0097	1.3789	0.981	1.2995	0.9655	1.2977	1.049	1.2544	0.9403	1.3966
	(0.3528)	(0.5931)	(0.3413)	(0.5578)	(0.3363)	(0.5570)	(0.3763)	(0.5579)	(0.3278)	(0.6008)
Not Employed	0.6922*	0.5544**	0.7193	0.5192**	0.6845*	0.5418**	0.6433**	0.5603**	0.5539**	0.6856
	(0.1505)	(0.1585)	(0.1629)	(0.1530)	(0.1509)	(0.1566)	(0.1429)	(0.1627)	(0.1441)	(0.2306)
Sick	1.9157***	1.1334	1.9317***	1.1394	1.9197***	1.1423	1.7466**	1.0072	1.9077***	1.1555
	(0.4562)	(0.3859)	(0.4596)	(0.3881)	(0.4569)	(0.3885)	(0.4238)	(0.3547)	(0.4543)	(0.3943)
Married	0.8137	0.7034	0.8783	0.7843	0.8784	0.7837	0.9384	0.8356	0.8895	0.7772
	(0.1500)	(0.1647)	(0.1540)	(0.1731)	(0.1540)	(0.1728)	(0.1685)	(0.1887)	(0.1563)	(0.1719)
Civil Servant	1.669	1.2994	1.7292	1.2175	1.6702	1.3072	1.6897	1.2861	1.6504	1.3541
	(0.7088)	(0.6639)	(0.7411)	(0.6267)	(0.7086)	(0.6667)	(0.7202)	(0.6566)	(0.7040)	(0.6912)
Entrepreneur	0.4855**	0.8356	0.5072*	0.7759	0.4914**	0.8552	0.4643**	0.8411	0.4756**	0.8665
	(0.1717)	(0.3269)	(0.1824)	(0.3096)	(0.1733)	(0.3336)	(0.1661)	(0.3300)	(0.1685)	(0.3380)
Like work	0.6388**	0.6735*	0.6453**	0.6697*	0.6425**	0.6757*	0.6258**	0.7121	0.6518**	0.6701*
	(0.1146)	(0.1558)	(0.1157)	(0.1550)	(0.1151)	(0.1560)	(0.1145)	(0.1687)	(0.1170)	(0.1552)
Children	1.3172	1.4451								
	(0.2661)	(0.3744)								
Blue collar			1.124	0.7212						
			(0.3286)	(0.2539)						
Hard job					0.8557	0.7868				
					(0.2197)	(0.2481)				
Left							1.3727*	0.9972		
							(0.2378)	(0.2212)		
Job match									0.6829*	1.4019
									(0.1556)	(0.4030)
Pseudo R-Square	0.0666		0.0666		0.0657		0.0683		0.0702	
chi2	138.8169		138.8889		136.924		136.9297		146.2787	
p	0		0		0		0		0	

Notes: Multinominal logit estimations (reported is the effect of the variables on the probability that the respective reform option is preferred to an increase in the pension age). */ **/ *** denote the significance at the 10%/ 5%/ 1% level.

13.6.3 Job match

Finally, one might argue that our measures of intrinsic motivation may also capture other factors such as the job match quality. It is possible that individuals with a better match are more willing to continue to work simply because they are gaining rents from their present employment. Then, the significant relationship between intrinsic motivation and pension reform preferences would not indicate a causal effect but rather result from a better job match that increases both the general willingness to work and the preferences of a postponement of the statutory pension age. To address this concern, we proxy the quality of the respondent's job match by including a dummy variable equal to one if the respondent states that he can make use of his past work experience and/or job skills for his present job. The results presented in Table 13.7 indicate that individuals with a better job match are more likely to prefer an increase in the pension age than higher contributions. Including this variable, however, does not weaken the impact of intrinsic motivation on pension reform acceptance.

13.6.4 General reform inclination

Our theoretical reasoning for the impact of intrinsic motivation is specific to reforms related to working time. If this reasoning is indeed responsible for our empirical findings, we would not expect a significant impact on reform issues unrelated to working times. Significant results for non-work related reform issues would be a hint that intrinsic motivation is just a proxy for some other type of important individual characteristic which is not covered by our controls. To check for this possibility, we apply a placebo regression. We estimate a similar specification as in Table 13.2, but now for reform issues without any obvious theoretical link to intrinsic work motivation. Two different reform options are chosen which are completely unrelated to working conditions or working time: first, the approval to municipal suffrage for foreigners and, second, the approval of the need for Islam-teaching at German schools. The results of the regressions are presented in Table 13.8. In none of the cases our intrinsic motivation indicators are among the significant determinants.

Table 13.8: Robustness test: placebo analysis

	Municipal suffrage		Islam teaching	
Age < 25	0.1132*	0.1804***	0.1493***	0.1017***
	(0.0592)	(0.0399)	(0.0493)	(0.0347)
$25 \geq$ Age < 45	0.0755	0.1165***	0.1091***	0.0968***
	(0.0467)	(0.0314)	(0.0393)	(0.0269)
$45 \geq$ Age < 65	0.0478	0.0807***	0.0977***	0.0893***
	(0.0438)	(0.0291)	(0.0370)	(0.0250)
Youth in East	0.0357	0.0457**	-0.2850***	-0.2726***
	(0.0277)	(0.0189)	(0.0228)	(0.0162)
Union Member	0.0565	0.0659**	0.0246	0.0078
	(0.0401)	(0.0280)	(0.0332)	(0.0244)
Interested in Politics	0.0689**	0.0501**	0.0742***	0.0748***
	(0.0304)	(0.0207)	(0.0251)	(0.0176)
Female	0.0140	0.0025	0.0733***	0.0673***
	(0.0277)	(0.0190)	(0.0235)	(0.0165)
Job insecurity	-0.0696	-0.0503	0.0492	0.0205
	(0.0535)	(0.0374)	(0.0451)	(0.0332)
University	0.0386	0.0952***	0.0798**	0.0762***
	(0.0399)	(0.0263)	(0.0331)	(0.0225)
Unemployed	-0.0914	-0.0811**	-0.0896*	-0.0618*
	(0.0571)	(0.0390)	(0.0521)	(0.0354)
Not Employed	0.0557	0.0465*	0.0794***	0.0828***
	(0.0374)	(0.0266)	(0.0306)	(0.0226)
Sick	-0.1151***	-0.0469*	-0.0252	-0.0392
	(0.0395)	(0.0269)	(0.0344)	(0.0241)
Married	0.0086	0.0123	0.0482*	0.0358**
	(0.0296)	(0.0202)	(0.0253)	(0.0176)
Civil Servant	0.1019	0.0531	0.0452	0.0651
	(0.0754)	(0.0528)	(0.0594)	(0.0434)
Entrepreneur	0.0868	0.0975**	0.0185	0.0223
	(0.0601)	(0.0409)	(0.0517)	(0.0359)
Intrinsic motivation and organizational commitment				
Like work	0.0014		0.0358	
	(0.0297)		(0.0252)	
Work for firm		-0.0045		-0.0108
		(0.0257)		(0.0225)
Pseudo R2	0.0182	0.0186	0.1263	0.1039
Observations	1377	2909	1360	2885

Notes: Probit estimations (reported are average marginal effects). */ **/ *** denotes significance at 10%/ 5%/ 1% level.

Hence, the placebo test shows that between intrinsic motivation matters for pension reforms but not for the other reforms. This points to a specific link only for pension reform preferences. This backs our confidence that our results on pension reform preferences are driven by the proposed causal chain and not just a general individual inclination to accept change.[217]

13.7 Conclusion

Our findings suggest that intrinsic work motivation is indeed related to work-related reform processes - at least with respect to the formation of pension reform preferences. The empirical results confirm the predictions of our theoretical reasoning, which makes a clear case for the existence of such a link. Our intrinsic motivation proxy proves to be robustly significant in a series of econometric tests, in which we pay careful attention to an individual's physical job stress and apply numerous modifications to the included control variables. For a multitude of specifications, respondents who experience utility from their work beyond the money they earn are more willing to embark on reforms leading to a higher pension age. This key result has implications both for the intrinsic motivation literature and our understanding of reform processes. So far, intrinsic motivation has been recognized to be important for the efficiency of firms and organizations. Our findings point beyond that insight toward the formation of policy preferences and, thus, probably the adaptability of modern welfare states and societies. A lack of non-monetary work incentives can be a reform constraint and therefore highly relevant for a country's institutional adaptability.

While these insights can be helpful for a broader understanding of reform resistance in certain contexts, it is more difficult to derive conclusions of immediate policy relevance. A first difficulty is that a population's degree of intrinsic motivation is hardly verifiable. So it will not be possible to prescribe reform strategies for a country dependent on its population's level of intrinsic motivation. Furthermore, it is unclear to which extent policy really is able to influence this human trait, whether it is an exogenous feature or reactive to policy measures. There are some hints in the intrinsic motivation literature that this type of motivation is not purely exogenous.

[217] This placebo test also makes us confident that the notorious "single source bias" (Champbell and Fiske, 1959) does not poison our results in a serious way. This bias can occur if some unobservable circumstances of one single source (e.g. one survey) influence different answers so that emerging correlations are spurious. If, for example, a respondent had a good working day he might, consequentially, rate both his work motivation high and be particularly open for reforms.

For example, it is known that extrinsic incentives can crowd out intrinsic motives so that a lot may depend on adequate payment systems (Ockenfels et al., 2010). But these approaches are hardly under the government's direct control. Nevertheless, a modest conclusion from our results would be that reform strategists should be sensible for the possibility that a lack of intrinsic work motivation can be a relevant reform constraint.

Chapter 14

Television and individual belief formation*

14.1 Introduction

The analysis in the preceding chapters of this book support the view that individual preferences for redistribution or labor market policies cannot fully be explained by pure self-interest but also reflect fairness considerations, for example. An explanation for this general finding is that voters usually want to reduce inequality as far as it is driven by factors that are beyond individual control (such as luck or social conditions) but reward individual effort. Individuals, however, do not exactly know to what extent a certain level of inequality reflects differences in individual effort or is a consequence of other factors. Therefore, people have to form and rely on beliefs about the relative importance of effort as a determinant of success in life, for instance, when voting on redistributive policies.

The relevance of beliefs on the drivers of success as an explanation for policy preferences and also actual policies has been established both through studies using individual-level survey data (e.g. Alesina and Giuliano, 2009; Corneo and Grüner, 2002; Fong, 2001) and cross-national comparisons (Alesina et al., 2001; Alesina and Glaeser, 2004). Alesina et al. (2001), for instance, conclude that the observable differences in the size and structure if the U.S. and European welfare state are driven by considerable differences in beliefs. Despite their policy relevance, our knowledge about the process of individual belief formation remains still incomplete.

The literature on belief formation suggests that individuals use available information from various sources to learn about the rewards to effort and form their

* Other versions of this study are Hennighausen (2012, 2013).

corresponding beliefs about the drivers of success. They use, for instance, their personal experience or family history to learn about the relative importance of effort (Piketty, 1995; Di Tella et al., 2007; Giuliano and Spilimbergo, 2009).

Moreover, Alesina and Glaeser (2004) argue that observable differences in beliefs of Americans and Europeans do not just reflect differences in personal experience but are rather a result of political indoctrination. Convincing empirical evidence isolating the impact of indoctrination (such as exposure to Marxist ideas) on beliefs about the drivers of success is still missing. This contribution wants to close this gap by analyzing whether political indoctrination via mass media has a persistent impact on beliefs.

To answer this question empirically, I test whether the exposure to West German television and thereby to Western world views and ideologies has affected East Germans' beliefs. The focus on the case of the former German Democratic Republic (GDR) has at least two advantages: first, state-controlled mass media was used to promote the ideologies and world views of both German states. The predominant ideology not only differed considerably between Communist and Western states but also comprised assumptions about the determinants of success in life and social mobility.

Second, by focusing on the GDR, I can exploit a natural experiment on the reception of Western television broadcasts. Approximately 15 percent of the population living in the Southeast and the Northeast of the GDR could not receive Western television broadcasts. In these regions, the strength of the over-the-air television signal was too low to receive these broadcasts either because the nearest West German transmitter station was too far away or because the area was surrounded by mountains. Therefore, the population in these regions constitutes a natural counterfactual to the majority of GDR citizens who were already exposed to Western television before reunification. Moreover, since the decision to watch West German broadcasts was partly exogenous for each GDR citizen (given his or her place of residence), it is possible to overcome the self-selection problem common in empirical works on media effects.[218]

The empirical analysis draws on two different data sets. First, I use survey data collected in the GDR during the late 1980s to test whether the differential access to Western television is reflected in East Germans' beliefs before reunification. The

[218] Empirical approaches which do not use any exogenous source of variation in media access to measure media effects usually face a self-selection problem: it is not clear whether a person has a certain attitude *because* of a particular media source or whether the decision to utilize a media source is actually driven by prior attitudes.

second part of the analysis is devoted to the persistence of the Western television effect during the 1990s. For that purpose I exploit longitudinal data from the German Socio-Economic Panel (SOEP).

This study adds to the literature both on belief formation and on media. It is closely related to empirical studies on the role of television which indicate that values, attitudes or behavior are affected by information on different ways of life and world views as presented in entertainment programs (e.g. soap operas or movies). Recent examples are cable television in rural India which has improved women's status by offering information about urban life (Jensen and Oster, 2009) or access to national telenovelas in Brazil presenting mostly small and wealthy families which has increased divorce rates (Chong and La Ferrara, 2009) and reduced fertility (Chong et al., 2008). So far, literature has mostly focused on the immediate impact of media on attitudes and behavior. I provide further evidence indicating that television has also the power to persistently affect certain attitudes.

A further contributes of this study is the analysis of a permanent exposure to considerably different and biased media sources to beliefs about drivers of success. By this, it offers insights into the role of political indoctrination for the formation of individual beliefs (as suggested by Alesina and Glaeser, 2004).

Recently, the impact of Communism on individuals' attitudes or preferences has received much attention among economists. By focusing on the case of Germany, this literature usually interprets differences between East and West Germans as a result of different socialization during the 40 years of separation (e.g. Alesina and Fuchs-Schündeln, 2007; Heineck and Süssmuth, 2010). Socialization, however, is a broad and rather imprecise concept that encompasses all differences in general life experience. Attempts to identify the impact of specific aspects of socialization on individual beliefs (or other attitudes) have, to my knowledge, not been undertaken before. This study isolates the effect of indoctrination by state-controlled television on beliefs about the drivers of success from the broader aspect of different socialization and life experience in both parts of Germany. Bringing forward the argument that life experience of the population should not differ systematically between regions with and without Western television reception, differences between the two groups can be attributed to the impact of Western television and the set of information provided therein.

The remainder of this chapter is organized as follows: section 14.2 provides institutional facts about television in the GDR. The subsequent section offers some insights into the role of television for belief formation. Section 14.4 is devoted to

the discussion of the identification strategy, the empirical approach and the data. The results are presented in section 14.5, followed by a discussion of potential confounding factors and further tests in section 14.6. Finally, section 14.7 offers some concluding remarks.

14.2 Institutional background: television in the GDR

Following World War II, Germany was separated by the allied forces and in 1949 two independent German states were founded. While these states did not differ substantially before their separation (Alesina and Fuchs-Schündeln, 2007), 40 years of political and economic division led to a strong divergence in living standards. GDR citizens suffered from economic scarcity and political repression by the state authorities. In November 1989 the unexpected opening of the inner-German border by the GDR regime resulted in the merging of the two German states, with the monetary union in July 1990 and the political reunification in October 1990.

In both German states, the first television broadcasting corporations were founded in 1952 (e.g. Meyen, 2003). In West Germany, two public corporations were established, the First German Television (ARD) with its constituent regional broadcasting institutions and in 1963 the Second German Television (ZDF). The state-controlled television of the GDR consisted of two channels, DFF 1 and DFF 2, which started their regular broadcasting in 1956 and 1969. In February 1990 the GDR parliament declared East German television to be politically independent. Finally, in the course of political reunification, GDR television was integrated into the system of the Federal Republic of Germany (FRG) though Eastern and Western states are served by regional channels of their own.

In 1955 only 1.2 percent of the GDR households had a television set. The availability of television, however, strongly increased in the 1960s and 1970s.[219] In 1988 about 96 of 100 GDR households had at least one television set (GDR Statistical Office, various years).

The majority of GDR citizens was able to receive West German television (i.e. usually the main public stations ARD, ZDF, and a regional broadcast station) already before reunification and had, by this, access to different information about

[219] Already in 1965 48.5 percent of all households had a television set. The share of households with television further increased to 81.6 percent in 1975 and 93.4 percent in 1985 (GDR Statistical Office, various years).

the West and the way of life there but also on the situation in the GDR.

However, approximately 15 percent of the GDR population living in the Northeast around Greifswald and in the Southeast around Dresden (called "Valley of the Clueless") could not receive Western television (see also Etzkorn and Stiehler, 1998). In these regions the strength of the over-the-air-signal of West German television transmitter stations was below a certain threshold required for West German television reception either due to geographical or topological reasons (i.e. these regions were either too far away from the next transmitter station or surrounded by mountains).

Figure 14.1 illustrates the reception of the FRG television channel ARD within the GDR as well as the 15 administrative districts of the GDR. The dark areas mark the two regions without ARD reception that coincide almost perfectly with the district of Dresden and parts of the districts Neubrandenburg and Rostock.

Figure 14.1: West German television reception in the GDR

The figure shows the GDR administrative districts (left) and the access to the West German television channel ARD in the GDR (right). The quadratic dots indicate West German transmitters, and the dark areas are the regions without access to West German television.

The subsequent empirical analysis relies on the assumption that East Germans who had the opportunity to watch West German television actually did watch it, while those without access to Western television did not. Table 14.1 presents survey data on the frequency of watching West German television collected in 1988/89 in

Table 14.1: Self-reported frequency of watching West German television

	How often do you watch FRG television?					
District	Mean	Std.Dev.	Median	Never (in %)	Obs.	missings
Berlin	1.5	0.78	1	0.24	416	3
Cottbus	1.28	0.72	1	1.67	60	0
Dresden	**4.30**	**1.23**	**5**	**63.52**	**734**	**50**
Erfurt	1.40	0.76	1	1.23	641	8
Karl-Marx-Stadt	1.51	0.82	1	2.05	622	11
Leipzig	1.85	1.18	1	5.42	274	3
Magdeburg	1.35	0.72	1	1.09	542	7
Schwerin	1.47	0.91	1	1.04	191	1

How often do you watch West German television? (1) every day, (2) more than once a week, (3) once a week, (4) less than once a week, (5) never. *Source:* GDR survey data collected between November 1988 and February 1989 (provided by the Zentralinstitut für Jugendforschung).

eight of the fifteen GDR-districts. The self-reported intensities of FRG television reception indicate its popularity.[220] The average respondent watched FRG broadcasts almost every day. Those from the Dresden-district, however, watched Western television significantly less often than those living in other parts of the GDR. Overall, 63.5 percent of the respondents living in the district of Dresden declared that they never watch Western television.

14.3 The role of Western television in belief formation

In general, individuals have only an imperfect knowledge about the true relationship between effort and success in life. Consequently, they have to rely on beliefs regarding this relationship, for instance, when voting on redistributive policies or deciding on how much effort to put into work. To form these beliefs, individuals use (noisy) signals they receive from different sources (ranging from own experience and learning from earlier generations to information provided by others).

So far, both theoretical and empirical studies show that personal experience matters for belief formation (e.g. Piketty, 1995; Giuliano and Spilimbergo, 2009;

[220] West German television programs were very popular among GDR citizens both as a source of political information and entertainment. The regime had been well aware of this popularity. In the 1960s, the authorities took several measures to prevent the reception of West German television (e.g. removing antennas directed to the West). In the 1970s, however, Erich Honecker stated that everyone could use Western media sources as he or she wanted to. At the latest in the 1980s, most East Germans watched FRG television (Stiehler, 2001).

Di Tella et al., 2007). Alesina and Glaeser (2004) provide an alternative explanation for the observed heterogeneity in beliefs between the United States and Europe. The authors point out that this heterogeneity does not necessarily reflect differences in experience or incentives[221] but are rather a result of political indoctrination. While Europeans have long been exposed to Marxist ideas about the class system, right-wing politicians in the United States had more power to push their own way of understanding economic opportunity.

Several empirical studies comparing popular beliefs and attitudes toward the welfare state in former socialist countries and Western democracies indeed find systematic and persistent differences (Corneo and Grüner, 2002; Suhrcke, 2001). In the case of Germany, these differences are particularly obvious: even several decades after reunification, East and West Germans entertain different beliefs and preferences for state intervention (e.g. Alesina and Fuchs-Schündeln, 2007; Heineck and Süssmuth, 2010, ; see also the empirical analysis in chapter 12 and 13). In line with Marxist ideas about limited opportunities of upward social mobility in the working class, East Germans are more inclined to believe that external forces (such as social conditions and connections) determine individual fortunes than West Germans. These persistent differences are widely interpreted as an overall consequence of socialization such as experience of life in a communist regime and a planned economy as well as exposure to the Marxist-Leninist ideology in schools, at the work-place and in mass media. Due to a considerable degree of centralization in virtually all policy fields, there should be no systematic differences in general life experience or indoctrination in schools or at work among GDR citizens. In one respect, however, the experience of East Germans differed: while people living in the Northeast and Southeast of the country could only watch state-controlled GDR television, most people had also access to West German television broadcasts and the set of information provided therein.

Television, which is a powerful tool for politicians to disseminate their ideological ideas, was used for political indoctrination in the GDR. Consequently, the set of information provided by both Western and Eastern television broadcasts had been biased in favor of the respective world views and ideologies and, thus, differed

[221] Alesina and Angeletos (2005) argue that any preexisting differences in beliefs between countries can be manifested since they result in different welfare policies with different implications on incentives to exert effort. This can explain why systematical deviations in beliefs about the role of effort in income generation can persist between the United States and European countries. Benabou and Tirole (2006a) further argue that individuals need to believe in a "just world" to motivate themselves or their children toward effort. Therefore, they systematically distort their beliefs by (subconsciously) ignoring information indicating the opposite.

considerably during the cold war.

Empirical evidence indicates that biased reporting by television affects attitudes and voting behavior. The choice of television news by individuals in the Islamic world correlates with their attitudes toward the United States (Gentzkow and Shapiro, 2004): persons watching Al Jazeera are more skeptical toward the United States than those watching CNN International.[222] Moreover, politically biased television broadcasts affect voting behavior (e.g. DellaVigna and Kaplan (2007) for the U.S. and Enikolopov et al. (2011) for Russia). Existing evidence for the GDR, however, does not indicate a successful indoctrination of GDR citizens by biased television reports. Kern and Hainmueller (2009) find that access to Western television actually increased the satisfaction with life in the GDR in the late 1980s. Despite a more critical view on the situation in the GDR, the availability of Western television seemingly stabilized the regime. The authors argue that Western television entertained GDR citizens and, by this, made their life more bearable. The relevance of West German entertainment programs as free time activity has been emphasized by several media studies focusing on East Germany (e.g. Meyen, 2002).

As indicated by recent empirical studies, entertainment programs have the power to change individual attitudes or behavior (an extensive survey is provided by Prat and Strömberg, 2011). Movies or soap operas expose individuals to information on different ways of life and the characters presented in these programs serve as role models. Jensen and Oster (2009) show that access to cable television and, thus, the opportunity to learn about the life and status of urban women as presented in soap operas has lowered the acceptability of domestic violence against women and son preferences in rural India. Additional evidence is based on the reception of famous Brazilian telenovelas which present families that are usually smaller and wealthier than the average family in Brazil. Individuals who are exposed to this information seem to adapt the favorable assessment of smaller family sizes since the fertility is lower (Chong and La Ferrara, 2009) and divorce rates are higher (Chong et al., 2008) in areas where these telenovelas are available.

Given the popularity of West German entertainment programs among the population of the GDR and motivated by recent findings regarding the role of television, I expect that West German television broadcasts affected East Germans' beliefs about the drivers of success in a comparable way. By watching Western entertainment programs, GDR citizens were exposed to world views, values and ideologies

[222] This finding, however, does not allow any conclusions about the causal impact of exposure to biased mass media on attitudes since the decision to watch Al Jazeera or CNN International is likely to be driven by a person's prior attitudes toward the United States.

common in the West.[223] The everyday confrontation with a different world view and ideology is assumed to make people absorb at least part of it. This should also be true for beliefs about the relative merits of effort as a determinant of success since the Marxist and Capitalist ideology differ considerably in this issue. Though access to West German television broadcasts does not imply a uniform effect of exposure to Western ideas and ideology, on average East Germans who received this information might be expected to entertain beliefs that are different from those citizens who had only access to the views provided by GDR television.

Moreover, beliefs that have been built up over decades are likely to remain relatively stable over time (Giuliano and Spilimbergo, 2009). Thus, differences between East Germans with and without access to West German television should not diminish very quickly once everyone has had access to these broadcasts.

14.4 Empirical strategy and data

A naïve econometric approach to analyze how television affects individual beliefs would be to regress these beliefs on (self-reported) television watching. However, the choice of a certain television broadcast may not be exogenous: if a person agrees widely with the socialist ideology and is, thus, more inclined to share the predominant beliefs he might avoid Western television broadcasts. In this case, any correlation between Western television and beliefs cannot be interpreted as a causal effect. To overcome this self-selection problem, I exploit the exogenous variation in regional availability of West German television broadcasts in the GDR. Basically, my empirical strategy is to compare the beliefs of GDR citizens who had access to Western television already before reunification with those who had not. A similar approach has recently been applied by Bursztyn and Cantoni (2012) and Kern and Hainmueller (2009).[224]

[223] While objective information about the possibilities of upward mobility can be also presented in the news, East Germans might even learn more about - and probably adopt - Western ideas about social mobility and income generation by watching movies or soap operas in which characters get promoted due to their effort or experienced upward mobility e.g. during the economic miracle in the 1950s and 1960s ("Wirtschaftswunder"). In addition to West German productions also U.S. soap operas (e.g. Denver Clan and Dallas) had been very popular among GDR citizens (Hesse, 1988).

[224] Kern and Hainmueller limit their analysis on the late 1980s and offer, thus, no information on the persistence of the Western television effect on particular attitudes. Bursztyn and Cantoni relate advertisement in West German television during the 1980s to East Germans' consumption choices after reunification. While Western television does not affect overall consumption levels, the intensity of advertisement during the 1980s is reflected in consumption of certain categories of goods in 1993 for East Germans who had access to FRG broadcasts.

In a first step, I use survey data collected by the central institute for youth research ("Zentralinstitut für Jugendforschung") between November 1988 and February 1989 in eight of the fifteen GDR districts.[225] This survey covers mostly teenagers and young adults employed in preselected production units.[226] The data contains information on a range of attitudes and beliefs as well as on socioeconomic characteristics which allow to measure the impact of several decades of exposure to Western television on East Germans beliefs. Based on this data, I estimate the following reduced form equation:

$$Y_{id} = \beta_0 + \beta D_d + \gamma X_{id} + \delta G_d + \epsilon_{id}, \tag{14.1}$$

where the outcome variable Y_{id} denotes the belief of an individual i living in district d.[227] This dummy variable equals one for respondents who believe that a high level of effort pays off for the society and also for themselves, and is zero otherwise.[228] The key variable of interest, D_d, indicates whether the respondent lives in a district with West German television reception. Since the area of the GDR without access to Western television has coincided almost perfectly with the district of Dresden, D_d is equal to a *Dresden*-dummy.[229] Furthermore, X_{id} includes a set of individual-level controls and G_d captures several district characteristics.

After focusing on the impact of differential access to Western television on East Germans' beliefs in the late 1980s, the second part of the empirical analysis is

[225] These districts are Berlin, Cottbus, Dresden, Erfurt, Karl-Marx-Stadt, Leipzig, Magdeburg, and Schwerin.

[226] Several GDR survey data sets have been collected by the GESIS-ZA and made available for social research. In general, one might be skeptical about the reliability of data collected by GDR institutions as the respondents may not have revealed their true opinions due to fear of political prosecution or disadvantages for their future life or career. However, the researchers had guaranteed anonymity by distributing the questionnaires to a group of participants, gave them the opportunity to answer them on their own and collected them altogether afterwards (e.g. Stiehler, 1998; Meyen, 2003). This process seemed to work as many respondents gave critical answers e.g. to questions concerning the regime and authorities.

[227] More detailed information on the variables and the corresponding survey questions is available in Table B.4 in the appendix.

[228] The exact wording of the question is as follows: "I have made the experience that a high level effort (*hohe Leistungen*) pays off for the society and also for myself". The German word *Leistung* might not only be translated by effort but also by achievement or performance. From my point of view, effort better fits the meaning of this sentence. The key statement and also the interpretation of the empirical analysis does not change if one assumes that the survey question refers to achievements or performance. Still, this question addresses the relevance of discretionary factors, which can be directly controlled by an individual.

[229] Besides the district of Dresden also parts of the districts Rostock and Neubrandenburg had no access to Western television (see Figure 14.1). For the latter, however, no survey data is available.

devoted to its persistence during the 1990s. For that purpose, I make use of data from the German Socio-Economic Panel. The SOEP is a longitudinal study of private households designed to be representative for the German population. While for West Germany the survey has been conducted annually since 1984, the former GDR was covered the first time in June 1990. The "East-sample" includes 2,179 households with 4,453 members who were surveyed in 1990 (Wagner et al., 2007).[230]

I use data from this sample collected during the 1990s to estimate the following equation:

$$Y_{idt} = \beta_0 + \beta D_{d,1990} + \gamma X_{idt} + \delta G_{dt} + \mu_t + \epsilon_{idt}, \tag{14.2}$$

where Y_{idt} is the belief an individual i living in district d holds in year t, X_{idt} (G_{dt}) denotes a set of individual-level (district-level) controls, μ_t includes year fixed effects and Western television availability in district d before reunification is indicated by $D_{d,1990}$. This variable equals one if Western television reception was not already possible during the German separation, and zero otherwise. Respondents are assigned into groups with and without Western television based on their place of residence at the level of regional planning units (*Raumordnungsregionen*) in June 1990.[231] In the baseline regression $D_{d,1990}$ is equal to one if an individual lived in the former district of Dresden i.e. the regional planning units "Dresden" and "Oberlausitz" in 1990 and, thus, most likely had no access to Western television. Consequently, the treatment status of an individual is defined by his place of residence before reunification and does not change over time (i.e. is independent of an individual's place of residence after 1990).[232]

The questions referring to individual beliefs were asked in the survey waves from 1994 to 1996 and in 1999. The dependent variable LUCK equals one if the respondent claims that achievement in life is mainly a matter of luck, and is zero otherwise.

The descriptive statistics presented in Table 14.2 already indicate that at the end of the 1980s persons living in Dresden were less inclined to believe that effort

[230] Further information on the SOEP is available online at `http://www.diw.de/en/diw_02.c.222508.en/soep_overview.html`.

[231] Regional planning units are smaller than the regions at the NUTS 2-level but bigger than counties. In 1990 Germany had 97 regional planning units with 23 of them located in East Germany.

[232] I have dropped persons living in households which had moved since 1988 to avoid an erroneous assignment of respondents. Furthermore, respondents who lived in 1990 in the regional planning unit "Greifswald-Stralsund" are not included in the baseline regressions since they had only partly access to Western television before reunification.

Table 14.2: Descriptive statistics of the dependent variables

	(1) Whole sample			(2) Dresden			(3) Other parts of the GDR			(2) - (3) Difference
	Mean	Standard Dev.	Obs.	Mean	Standard Dev.	Obs.	Mean	Standard Dev.	Obs.	
Effort pays off										
1988/89	0.5824	0.4932	3381	0.5299	0.4995	736	0.5970	0.4906	2645	-0.0671***
Luck matters for success										
1994-99	0.221	0.415	13204	0.250	0.433	1385	0.218	0.413	11819	0.0323***
1994	0.206	0.404	3085	0.251	0.434	370	0.210	0.408	3455	0.0458**
1995	0.194	0.395	3014	0.243	0.429	342	0.199	0.399	3356	0.0489**
1996	0.186	0.389	2957	0.218	0.414	353	0.189	0.392	3310	0.0325*
1999	0.2909	0.454	2763	0.2909	0.455	320	0.2906	0.454	3083	-0.0004

Notes: ***/**/* denotes significance of the differences of mean values between the two groups at the 1%/5%/10% level.

determines success in life. In the 1990s the differences between the two groups are smaller but individuals without access to Western television before reunification were still more likely to ascribe success to factors exogenous to the individual (e.g. luck) than to behavior.[233]

Identifying assumptions

The identifying assumption is that individuals in regions with access to West German television would not have been different from those without access if they had not had Western television. Basically, this implies that the inhabitants of the Dresden-district should be on average comparable to other GDR citizens except for the differential access to Western television. I discuss this in more detail below.

First, policy preferences or beliefs must not have differed before television broadcasting began in the 1950s. Table 14.3 offers information on voting behavior at the Reichstag election of 1932 for electoral districts located in areas that became part of the GDR after World War II. The constituency "Dresden-Bautzen" is geographically mostly identical to the later GDR district Dresden. The electoral data does not indicate systematic differences between Dresden and other East German constituencies in voter turnout or vote shares of the most prominent parties. Especially, the total vote share of the two leftist parties, the communist party (KPD) and the social

[233] The summary statistics for all variables are available in Table B.6 and B.7 in the appendix.

Table 14.3: Electoral outcomes in the Reichstag election 1932

Electoral district	Voter turnout	Party vote share					
		KPD	SPD	Zentrum	DVP	DNVP	NSDAP
Berlin	80.6	33.4	27.9	4.6	0.4	6.7	24.6
Chemnitz-Zwickau	89.2	19.6	22.4	0.7	0.8	3.8	47
Dresden-Bautzen	**86.4**	**14.3**	**31.1**	**2.1**	**2.9**	**5.5**	**39.3**
Frankfurt (Oder)	84.2	9.6	23.5	6.3	1	9.2	48.1
Leipzig	90.5	18.7	33.1	1.1	2.2	4.5	36.1
Magdeburg	88.8	11.1	32.3	2	1.2	7.5	43.8
Mecklenburg	83.9	9.4	31.1	1.2	1.7	9.5	44.8
Merseburg	85.3	24.3	19.8	1.6	1.2	8.1	42.6
Potsdam I	85	20.1	26.7	3	0.8	9	38.1
Potsdam II	81.9	20.3	26.3	5.2	1.1	10.9	33
Thuringia	85.6	16.8	22.1	4.7	1.6	4.7	43.4
overall	85.6	18.0	26.9	3.0	1.4	7.2	40.1

Vote shares and turnout by constituencies in the election of the Reichstag on July 31^{th}, 1932. The electoral district of Dresden-Bautzen mainly coincides with the district of Dresden. *Source:* Statistisches Reichsamt Germany (1926)

democrats (SPD), accounts for 45.4 percent in Dresden-Bautzen, which is almost identical to the average of 44.9 percent in all East German districts, although the distribution of votes between these two parties differs somewhat.

Second, both groups should be comparable with respect to other characteristics which may have an impact on individual beliefs. If, for instance, the economic conditions have been different in regions with and without Western television, beliefs about the relevance of effort may simply reflect different economic opportunities faced by individuals in each region.[234] Therefore, Table 14.4 compares the Dresden-district with other parts of the GDR. Indeed Dresden is - compared to the GDR-average - more industrialized, and its inhabitants seem to have a stronger interest in culture as indicated by the higher share of theater visitors.

[234] Dresden was an important industrial region already before World War I and this might have given it a better start after reunification. The traditional industries in Dresden (as well as other parts of Saxony, Berlin, and Magdeburg) established before 1945 were more likely to have a comparative advantage than the new "planned industries" which had mainly been established as substitutes for industries located in the FRG (Grundmann, 1997). Then, individuals from Dresden would have had a better starting position after the reunification and might conclude from their relative favorable economic situation that effort pays off.

Table 14.4: Comparison of GDR-districts

	(1) Dresden	(2) GDR with Western television	(1)-(2) (p-value)	(3) excl. Berlin	(1)-(3) (p-value)	(4) Saxony	(1)-(4) (p-value)	(5) Eastern GDR	(1)-(5) (p-value)	(6) Valley	(7) GDR	(6)-(7) (p-value)
Population density	254	408.25	-154.25	156.82	-97.18	285	-31	168.67	-85.33	146.33	408.25	-261.92
			(0.5534)		(0.0017)		(0.3193)		(0.3292)			(0.6226)
Female population	52.6	52.01	0.59	51.97	-0.63	52.85	-0.25	51.84	-0.7573	51.6	52.01	-0.41
(% district pop.)			(0.0030)		(0.0037)		(0.4120)		(0.3354)			(0.3193)
Working age population	62.9	65.03	-2.13	64.81	1.91	63.75	-0.85	64.87	1.91	64.63	65.03	-0.4
(% district pop.)			(0.0000)		(0.0000)		(0.3656)		(0.1508)			(0.6049)
High educated workers	20.6	20.1	0.5	18.93	1.67	18.85	1.75	18.85	-1.67	20.17	20.1	0.07
(% working pop.)			(0.6894)		(0.0009)		(0.5177)		(0.1568)			(0.9796)
Relative Labor Income	99	101.08	-2.08	100.91	1.91	98.5	0.5	103	4	98.67	101.08	-2.41
(GDR average $\bar{1}00$)			(0.0739)		(0.1249)		(0.7952)		(0.4015)			(0.2928)
Industrial employment	42.8	37.39	5.41	38.49	-4.31	44	-1.2	40.07	-2.73	29.27	37.39	-8.12
(% total empl.)			(0.0501)		(0.1039)		(0.8187)		(0.6672)			(0.1908)
Agricultural employment	8.1	11.19	-3.09	12.12	4.02	7.15	0.95	10.09	2.8	16.53	11.19	5.34
(% total empl.)			(0.0806)		(0.0190)		(0.5604)		(0.4306)			(0.0000)
Industrial production	10.7	7.01	3.69	7.15	-3.56	10.15	0.55	8.5	-2.2	5.27	7.01	-1.74
(% GDR ind. prod.)			(0.0062)		(0.0135)		(0.8536)		(0.3886)			(0.5066)
Hospital beds	95.7	99.22	-3.52	97.71	2.01	105.8	-10.1	83.67	-12.03	95.97	99.22	-3.25
(per 10,000 inhabit.)			(0.3879)		(0.6224)		(0.5842)		(0.1403)			(0.6979)
Theater visitors	0.0019	0.0015	0.0004	0.0014	-0.0007	0.0014	0.0005	0.0012	-0.0007	0.0018	0.0015	0.0003
(% district pop.)			(0.0189)		(0.0015)		(0.0340)		(0.0820)			(0.3634)

Comparison of mean values for treatment and control groups. The treatment group includes either (1) Dresden or (6) all districts without full access to West German television (Dresden, Neubrandenburg, and Rostock). *Sources:* GDR Statistical Office, information on labor income and share of working population with university degree from (Kind, 1997).

To take these observable differences between the Dresden-districts and other parts of the GDR into account, the baseline regressions include several district characteristics (such as population density and the share of agricultural and industrial employment) and the regional unemployment rate after reunification. Moreover, in section 14.6 several additional control variables are included, which account for alternative explanations for different beliefs.

The robustness of the results is further tested by varying the control group since Table 14.4 indicates that the choice of districts, which serve as a comparison group for Dresden may be crucial for the empirical analysis.

A further challenge to my identification is migration since this raises the possibility of self-selection. Spatial mobility in the GDR, however, was very low during the 40 years of its existence. This was mainly a consequence of the central-planned economy with the strong regional specialization on certain industries that hampered the mobility of workers. Beyond that the GDR faced a considerable housing shortage that further limited mobility.

Table 14.5 presents official statistics on population movements by district for the year 1988. There were some internal population movements with Berlin attracting people at the costs of most of the other districts. In general, a considerable part of all movements took place within districts. In Dresden-district these movements account for nearly 55 percent. In 1988 the net population outflow by district ranged from 0.52 to 1.54 percent of the total population, with Dresden being located at the lower end of this range.

Self-selection of individuals into regions with and without Western television may already have occurred at the beginning of television broadcasting in the 1950s. Population movements between 1953 and 1957 seem, however, not to be driven by current or expected future reception of Western television. Dresden, where these popular broadcasts were not available, experienced a net inflow, whereas seven districts faced a net population outflow.

After the Berlin wall had been built in August 1961 approximately 750,000 people emigrated from the GDR until 1989 (Maretzke, 1991). The GDR statistical office provided official data on cross-border migration in 1989 (column 5 and 6 of Table 14.5). The GDR regime opened the borders to the FRG in November and, thus, gave the citizens the opportunity to emigrate. Already in 1989, within two months after the borders had been opened, around 297,000 people left the GDR. The emigration as a percentage of total district population ranges from 0.74 in Neubrandenburg to

Table 14.5: Internal and external migration in the GDR 1988/89

	Internal migration			Cross-border migration (1989)	
District	net outflow 1953-1957 (%)*	% within districts	net outflow 1988 (%)*	gross emigration	emigrants (%)*
Berlin				33683	2.62
Cottbus	-1.48	49.22	0.99	13516	1.53
Dresden	**-0.15**	**54.54**	**0.70**	**46017**	**2.62**
Erfurt	0.73	50.85	0.66	20445	1.65
Frankfurt	-3.61	36.56	1.54	10788	1.51
Gera	-0.34	51.99	0.83	15632	2.11
Halle	1.19	52.14	-0.93	27319	1.54
Karl-Marx-Stadt	3.07	61.47	0.52	40347	2.17
Leipzig	-0.31	44.82	0.97	30654	2.25
Magdeburg	0.84	52.50	0.74	14761	1.18
Neubrandenburg	2.70	41.34	1.33	4590	0.74
Potsdam	-3.19	42.45	1.10	17026	1.52
Rostock	-0.55	46.29	1.09	11279	1.23
Schwerin	1.45	46.02	1.02	6029	1.01
Suhl	0.91	43.42	0.74	4872	0.89
GDR				296958	1.64
Average	0.09	48.12	0.81		

* As a share of total district population in the previous year. *Source:* Information on internal migration based on GDR Statistical Office (various years).

2.62 in Berlin and Dresden. Compared to individuals in other districts, those from Dresden were more likely to leave the GDR. However, this difference is not large.

Although I cannot completely rule out the possibility of self-selection, I address this issue by using longitudinal data. Doing so, I can control for spatial mobility once the treatment status of an individual has been identified based on his place of residence in June 1990. In principle, my findings could also be driven by some Dresden-specific factor. In section 14.6, I discuss and test the relevance of several alternative explanations of the findings. Since the results remain robust, I am confident that my findings can be explained by differential access to Western television.

14.5 Econometric analysis

Table 14.6 presents the empirical findings concerning the determinants of the belief that effort pays off during the late 1980s. I employ a probit approach since the dependent variable is binary. As a first test of the robustness of the results to the inclusion of control variables, I gradually add a set of variables capturing individual- and district-level characteristics. I start with a regression of the respondents' belief on the Dresden-dummy (i.e. the treatment indicator), the second specification adds

a set of individual-level controls and specification 3 further includes district-level characteristics.

Table 14.6: Effort pays off, GDR late 1980s

	(1)	(2)	(3)
Dresden	-0.0664***	-0.0645***	-0.0682***
	(0.0229)	(0.0212)	(0.0201)
Age		-0.0103	-0.0108
		(0.0172)	(0.0182)
Age^2		0.0002	0.0002
		(0.0003)	(0.0003)
Female		0.1222***	0.1284***
		(0.0363)	(0.0357)
Married		-0.0503*	-0.0428*
		(0.0260)	(0.0252)
Widowed or divorced		-0.0475	-0.0371
		(0.0415)	(0.0432)
Children		0.0309	0.0306
		(0.0360)	(0.0360)
Net income		0.0088**	0.0111***
		(0.0039)	(0.0033)
Intermediate education		-0.0735*	-0.0709*
		(0.0427)	(0.0398)
High education		-0.0423	-0.0322
		(0.0394)	(0.0403)
University degree		-0.1534***	-0.1585***
		(0.0450)	(0.0456)
Population density			-0.0001
			(0.0001)
Industrial employment			-0.0059
			(0.0078)
Agricultural employment			-0.0049
			(0.0133)
Pseudo R2	0.0023	0.0190	0.0224
Observations	3381	2517	2517

Notes: Probit regressions (average marginal effects are shown). Robust standard errors in parentheses, clustered at district level. ***/**/* denotes significance at the 1%/5%/10% level.

As can be seen, living in a region with access to Western television increases the probability to believe that effort pays off by almost 7 percentage points. A possible interpretation of this finding is that Western television has offered GDR citizens a "window to the Western world" with its values and attitudes through both political reporting and entertainment and, thereby, has made them share a belief more common in the West.

Apart from Western television exposure, several socioeconomic characteristics have a significant impact on individual beliefs. The probability of stressing the

importance of effort for success is, other things equal, lower for male, married, better educated,[235] and poorer individuals.

Does the effect of differential access to Western television on East Germans' beliefs persist after FRG broadcasts had been available in all parts of the GDR and individuals could also learn about life in West Germany by their own experience? Table 14.7 displays the results of the probit estimates on the determinants of beliefs between 1994 and 1999. In the first column, the belief that success in life is mainly a matter of luck is regressed on the Dresden-dummy and year fixed effects. The following specifications successively add a set of individual-level controls (specification 2), the regional unemployment rate (specification 3) and current state of residence fixed effect (specification 4).

The findings suggest that the exposure to FRG television had a persistent effect on East Germans' beliefs: persons who had access to Western television were less likely to believe that luck determines opportunities in life than individuals from parts of the GDR without Western television. This is the case, although I control for current economic factors (e.g. net household income, occupation, and employment status) and regional unemployment. The effect of television on individual beliefs is also sizable as the marginal effect of the Dresden-dummy ranges from 3.2 to 4.8 percentage points. Thus, the impact of FRG television is 1.5 to 2 times the effect of being currently unemployed.

Several further explanatory variables affect individual beliefs. The respondent's age has a significant but non-linear impact. The probability of believing that luck is a major determinant of success is higher for women, unemployed respondents, blue collar workers, and civil servants. Furthermore, the perceived relevance of luck decreases in both the respondent's own and his father's level of education,[236] the household income, the number of children living in the same household and increases in household size as well as former unemployment experience. Finally, living in states with higher unemployment as well as in West Germany increases the perceived importance of luck (at least if other state characteristics are captured by current state of residence fixed effects).

The regression results presented in Table 14.8 provide further insights into how

[235] The fact that highly-educated individuals are less inclined to believe that effort pays off for themselves might be a consequence of the communist system itself: income inequality was low in the GDR, implying that a person with an university degree had no substantially higher income than a low educated worker. Hence, the beliefs of highly-educated individuals may simply reflect their personal experience. Another explanation might be that only citizens who agree with socialism were allowed to attend a university.

[236] The results do not change if instead of the father's the mother's level of education is included.

Table 14.7: Success in life is mainly a matter of luck, FRG 1994-99

	(1)	(2)	(3)	(4)
Dresden	0.0321**	0.0402***	0.0447***	0.0481***
	(0.0153)	(0.0112)	(0.0121)	(0.0144)
Age		-0.0181***	-0.0178***	-0.0180***
		(0.0061)	(0.0061)	(0.0064)
Age^2		0.0004***	0.0004***	0.0004***
		(0.0001)	(0.0001)	(0.0001)
Age^3		-0.0000***	-0.0000***	-0.0000***
		(0.0000)	(0.0000)	(0.0000)
Female		0.0405***	0.0405***	0.0400***
		(0.0110)	(0.0111)	(0.0106)
Father's education		-0.0204**	-0.0196**	-0.0185**
		(0.0087)	(0.0089)	(0.0078)
Married		0.0214	0.0204	0.0178
		(0.0188)	(0.0192)	(0.0205)
Married but separated		0.0620	0.0607	0.0658
		(0.0436)	(0.0450)	(0.0440)
Widowed or divorced		0.0366	0.0358	0.0343
		(0.0351)	(0.0351)	(0.0358)
Not employed		0.0164	0.0172	0.0142
		(0.0201)	(0.0201)	(0.0201)
Retired		0.0117	0.0116	0.0119
		(0.0196)	(0.0196)	(0.0199)
Unemployed		0.0263*	0.0256*	0.0252*
		(0.0135)	(0.0137)	(0.0139)
Self employed		-0.0027	-0.0020	-0.0041
		(0.0181)	(0.0181)	(0.0178)
Civil servant		0.0806**	0.0806**	0.0863**
		(0.0359)	(0.0366)	(0.0346)
White collar		-0.0212***	-0.0217***	-0.0233***
		(0.0053)	(0.0051)	(0.0052)
University degree		-0.0814***	-0.0809***	-0.0778***
		(0.0161)	(0.0159)	(0.0153)
High education		-0.1110***	-0.1103***	-0.1075***
		(0.0227)	(0.0234)	(0.0238)
Intermediate education		-0.0384**	-0.0379**	-0.0379**
		(0.0166)	(0.0166)	(0.0170)
No. persons in household		0.0252***	0.0245**	0.0217**
		(0.0097)	(0.0100)	(0.0086)
No. children in household		-0.0276***	-0.0269**	-0.0247**
		(0.0103)	(0.0108)	(0.0104)
Log. household income		-0.0822***	-0.0810***	-0.0760***
		(0.0141)	(0.0146)	(0.0156)
Currently living in West Germany		-0.0142	0.0425	-0.0151**
		(0.0295)	(0.0479)	(0.0076)
Unemployment experience		0.0082**	0.0083**	0.0078**
		(0.0033)	(0.0032)	(0.0035)
Unemployment rate (state level)			0.0081	0.0128***
			(0.0063)	(0.0035)
Year FE	YES	YES	YES	YES
State FE	NO	NO	NO	YES
Pseudo R2	0.0094	0.0671	0.0678	0.0732
Observations	12168	10356	10356	10352

Notes: Probit regressions (average marginal effects are shown). Robust standard errors in parentheses, clustered at Nuts2-level. ***/**/* denotes significance at the 1%/5%/10% level.

the impact of differential access to West German television on East Germans' belief that success in life is mainly a matter of luck developed during the 1990s.[237]

[237] The findings shown in Table 14.8 are based on a linear probability model since marginal

Regression (1) in Table 14.7 includes a time trend which is further interacted with the Dresden-dummy in specification 2. In general, the inclination to believe that luck matters success has increased over time but the interaction effect indicates that this development is different for individuals who are originally from the district of Dresden compared to those from other parts of the GDR. Whereas the probability to state that luck matters for success is decreasing over time for individuals from the former district of Dresden, those from other parts of the GDR became more inclined to stress the relevance of luck during 1990s. This is also supported by a differential time trend (comp. specification 3 and 4). Thus, there has been a convergence in the perceived importance of luck for success in life between individuals with and without access to West German broadcasts during German separation.

Furthermore, I test the relevance of age or cohort effects for the convergence of beliefs. The results of specification 3 do not point at any differential impact of age on the belief that luck matters. The analysis of five different birth cohorts, however, reveals significant differences between Dresden and the rest of the GDR. Compared to the oldest group of individuals (i.e. those born before 1920), younger cohorts in Dresden are more inclined to believe that success in life is mainly driven by luck. For individuals from other parts of the GDR no such significant difference between the cohort groups exists.

Finally, recent life experience might not have a similar impact on individuals with differential access to Western television already before reunification. Specification 5 indeed indicates that moving to West Germany has lowered the probability to believe that luck matters for individuals who are originally from regions with access to Western television but has no significant impact on those from Dresden.

Table 14.9 further presents how changes in the cohort composition versus actual changes in respondents' beliefs contribute to the convergence between the two groups. The analysis is based on a balanced panel data set including only individuals who answered all questions between 1994 and 1999. By comparing the differential time trend for this sample with the unbalanced sample used for specification 4 in Table 14.8, I can calculate the share of the convergence that is driven by a change in cohort composition (i.e. a dropping out of older cohorts) versus the part that is driven by actual changes in beliefs over time. The coefficient of the interaction variable "Time trend x Dresden" is approximately 25 percent smaller for the bal-

effects of interaction terms as calculated in nonlinear models (such as Probit) are likely to be inconsistent (Ai and Norton, 2003). By estimating a linear probability model, it is possible to interpret the significance and direction of the interaction effect (even if a regression includes more than one interaction term).

anced panel indicating that around 75 percent of the convergence is driven by actual changes in beliefs and not by changes in the sample composition.

Table 14.8: Luck matters for success (FRG 1994-99): interaction effects

	Convergence or Divergence in beliefs		Age vs. Cohort effects		West Germany
	(1)	(2)	(3)	(4)	(5)
Dresden	0.0502***	0.1108***	0.0316	-0.0203	0.0470***
	(0.0143)	(0.0205)	(0.0266)	(0.0230)	(0.0134)
Time trend	0.0112***	0.0122***			
	(0.0026)	(0.0026)			
Time trend x Dresden		-0.0088***			
		(0.0022)			
Age			0.0010		
			(0.0009)		
Age x Dresden			0.0005		
			(0.0005)		
Born 1920 - 1945				0.0185	
				(0.0325)	
Born 1946 - 1960				0.0008	
				(0.0385)	
Born 1961 - 1975				-0.0160	
				(0.0541)	
Born 1976 - 1990				0.0012	
				(0.0642)	
Born 1920 - 1945 x Dresden				0.0888***	
				(0.0386)	
Born 1946 - 1960 x Dresden				0.0722**	
				(0.0325)	
Born 1961 - 1975 x Dresden				0.0536***	
				(0.0336)	
Born 1976 - 1990 x Dresden				0.0847***	
				(0.0433)	
West Germany					-0.0188**
					(0.0092)
West Germany x Dresden					0.0536
					(0.0946)
Year FE			YES	YES	YES
Observations	10356	10356	10356	10356	10356
R2	0.0690	0.0692	0.0708	0.0716	0.0717

Notes: Linear probability model estimated based on specification (4) in Table 14.7. Robust standard errors in parentheses, clustered at Nuts2-level. ***/**/* denotes significance at the 1%/5%/10% level.

Table 14.9: Luck matters for success (FRG 1994-99): differential time trends (balanced panel)

	(1)	(2)	(3)
Dresden	0.0824***	0.0862***	0.0899***
	(0.0262)	(0.0204)	(0.0224)
Time trend	0.0207***	0.0144***	0.0145***
	(0.0033)	(0.0032)	(0.0029)
Time trend x Dresden	-0.0059*	-0.0059**	-0.0066***
	(0.0031)	(0.0023)	(0.0023)
State FE	NO	NO	YES
Observations	9119	9119	9119
R2	0.0628	0.0638	0.0685

Notes: Linear probability model. Estimates include all explanatory variables introduced in specifications 2 to 4 in Table 14.7 but are restricted to individuals who answered the question on the relevance of luck for success in all years (balanced panel). Robust standard errors in parentheses, clustered at Nuts2-level. ***/**/* denotes significance at the 1%/5%/10% level.

14.6 Robustness and some further results

The empirical findings suggest that East Germans with access to Western television were more inclined to share beliefs more common in the West both before reunification and several years afterwards. Dresden seems to be on average comparable to other GDR-districts (see Table 14.3 and 14.4). Still, a major concern might be that factors others than television reception cause the differences in beliefs. In the following, I test the robustness of the results by varying the group of districts Dresden is compared to (control group) and include variables which account for alternative explanations.

14.6.1 Varying the control group

In Table 14.10 the robustness of the results is tested using different groups of districts as a comparison group for Dresden. First, I exclude observations from East Berlin from the sample. The district of Berlin is not fully comparable to other districts due to its position as the capital of the GDR and the fact that the former city of Berlin had been separated by the allied forces. Second, the analysis will be restricted to Saxon districts (Dresden, Leipzig and Karl-Marx-Stadt). These districts share a common history as parts of the Kingdom of Saxony and, therefore, most likely also a

common culture and values. Moreover, they are also highly comparable with respect to other characteristics (see Table 14.4). Furthermore, the observable differences could also be explained by the geographical location of the Dresden-district in the Eastern part of the GDR. It could also be the case that after the fall of the Berlin wall higher costs of travelling to West Germany due to the larger distance deters the population in the Eastern part from learning about the West by own experience. If that explains the different beliefs, then the same should apply to other regions located in the Eastern part of the GDR. Thus, I restrict the analysis to these regions. For the analysis based on the SOEP also data for the outermost Northeast of the GDR, which had only partial access to these broadcasts is available. Hence, the treatment group is extended to both regions without Western television reception (i.e., Dresden and the regional planning unit Greifswald-Stralsund).

The results indicate that the treatment effect remains widely unchanged if East Berlin is excluded or only Saxon districts are analyzed. If the control group is restricted to regions in the East of the GDR, the treatment effect becomes smaller. Furthermore, the treatment effect loses its significance if Greifswald is included as the second part of the GDR with only partial access to Western television. Although this may be an indication that the results are driven by (unobserved) Dresden-specific characteristics, the partial insignificance does not necessarily imply that Western television has no effect. The area in the Northeast without West German television reception did not coincide perfectly with "Greifswald-Stralsund" (as it was the case with the district of Dresden in the Southeast).[238] Consequently, the smaller and less significant treatment effect may reflect downward biased estimates as individuals might be assigned to the treatment group who actually had access to Western television. Furthermore, Dresden and Greifswald-Stralsund differ with respect to other characteristics (e.g. Greifswald-Stralsund is more rural). This heterogeneity might have contributed to the loss of significance since the treatment effect gets highly significant if state fixed effects controlling for such heterogeneity are included.

[238] This is also indicated by a survey conducted by the central institute for youth research in 1981. While 68.8 percent of the respondents living in the district of Dresden stated that they did not watch Western television at all, the share in the districts Rostock and Neubrandenburg was only 27 percent.

Table 14.10: Robustness test: different group of districts

	Effort pays off GDR, late 1980s		Success in life is mainly a matter of luck FRG 1994-99			
	(1)	(2)	(3)	(4)	(5)	(6)
			Baseline			
Dresden	-0.0664***	-0.0645***	0.0321**	0.0402***	0.0447***	0.0481***
	(0.0229)	(0.0212)	(0.0153)	(0.0112)	(0.0121)	(0.0144)
Pseudo R2	0.0023	0.0190	0.0094	0.0671	0.0678	0.0732
Observations	3382	2517	12168	10356	10356	10352
			Control group			
GDR without	-0.0783***	-0.0759***	0.0256*	0.0390***	0.0434***	0.0503***
Berlin	(0.0241)	(0.0215)	(0.0147)	(0.0117)	(0.0132)	(0.0145)
Pseudo R2	0.0035	0.0185	0.0095	0.0684	0.0687	0.0742
Observations	2990	2258	11279	9619	9619	9615
Saxony	-0.0859***	-0.0814***	0.0298	0.0483***	0.0480***	0.0477***
	(0.0023)	(0.0119)	(0.0203)	(0.0150)	(0.0146)	(0.0146)
Pseudo R2	0.0056	0.0232	0.0088	0.0796	0.0845	0.0878
Observations	1596	1218	4115	3532	3532	3522
Eastern part			0.0225	0.0435***	0.0448***	0.0277***
of the GDR	–	–	(0.0177)	(0.0127)	(0.0133)	(0.0072)
Pseudo R2			0.0095	0.0694	0.0696	0.0778
Observations			4068	3424	3424	3414
			Treatment group			
Dresden &			-0.0153	0.0004	0.0005	0.0423***
Greifswald	–	–	(0.0293)	(0.0314)	(0.0325)	(0.0160)
Pseudo R2			0.0095	0.0663	0.0663	0.0729
Observations			10963	9317	9317	9317

Notes: Probit regressions (average marginal effects are shown). The results shown in column 1 and 2 are based on the respective specifications in Table 14.6, while columns 3 to 6 are based on Table 14.7. For further information on included controls see Table 14.6 and 14.7. Robust standard errors in parentheses, clustered at Nuts2-level. ***/**/* denotes significance at the 1%/5%/10% level.

14.6.2 Alternative explanations

Now, I extend the baseline analysis by including additional district level characteristics which account for alternative explanations for the differences in beliefs. The GDR was a planned economy with a considerable amount of regional specialization on certain sectors and industries which affected the composition of the population (e.g. industrial vs. agricultural workers). To capture these differences several variables are added to the baseline regressions of the belief that effort pays off during the late 1980s (see Table 14.11). The relevance of industrial production in each district (i.e. district's share of gross industrial production of the GDR) is included

in column (1). Further controls are the share of working age population (as a percentage of total district population) in column (2) and the level of education of the district's working population (share of workers with an university degree) in column (3). While the share of industrial production has no significant effect on the respondents' beliefs, a higher share of population in their working age and better educated workers increase the probability to believe that effort pays off.

Furthermore, the geographical location of a district may be related to its inhabitants' attitudes. Hence, I include both a variable indicating whether a district has a common border with the FRG and the distance between the district capital and Berlin (in kilometers). The results, however, do not indicate a significant relationship.

Finally, Dresden was famous for its arts and culture. Thus, the population had perhaps been more interested in culture, arts, and literature. More generally, if (traditionally educated) middle-class intellectuals entertain different beliefs than the rest of the population this could also explain the main findings of this paper. Therefore, I include both dummy-variables indicating whether the respondent had lately been to a theater, cinema, or museum (specifications 6 to 8) and the number of theater visitors in each district (weighted by the total district population). The individual interest in arts and culture affects beliefs at least partly: individuals who visited cinema and museums are more likely to believe that effort pays off. Moreover, individuals in districts where a higher share of the population visits theaters are less inclined to believe that effort pays off.

An overall important finding is that the inclusion of these further control variables does not change the results in substance with the treatment indicator remaining robust and significant.

The identification of the Western television effect during the 1990s does not only depend on the absence of structural differences before reunification but also on the assumption that both regions were not hit by (systematically) different shocks afterwards. Otherwise, the observable differences between individuals from Dresden and those from other parts of the GDR could also be a consequence of differences in the economic or social conditions.

To address these concerns, I add several regional characteristics to my baseline specification using data from the SOEP (see specification 4 in Table 14.7). Table 14.12 displays the results. Due to data constraints, the specifications 2 to 6 are only based on observations for the years 1996 and 1999. To enhance the comparability of the results and to distinguish between the impact of different samples and of

additional controls, column 1 shows the results of the baseline regression based on observations from 1996 and 1999.

After reunification, wide parts of East Germany faced considerable problems as most parts of the GDR economy were not capable of competing with the West. Since unemployment increased during the 1990s, some East German regions experienced a considerable population loss and demographic problems. To capture related economic and demographic differences, I add each regional planning unit's population density (specification 2), share of inhabitants older than 65 (specification 3), unemployment rate (specification 4), average monthly labor income of industrial workers (specification 5), and GDP per capita (specification 6). The results indicate that only the regional unemployment rate has a significant effect on the respondents likelihood to believe that success is mainly a consequence of luck. More important, the coefficients of the Dresden-dummy remain highly significant and robust.

Another concern is related to cultural or religious differences between the two groups. Thus, I include the respondent's own religious denomination in 1990 and his mother's religion to proxy cultural effects.[239] The findings suggest a significant impact of religion on the belief regarding the role of luck for success: individuals with a religious mother (independent of her denomination) are more inclined to believe that luck matters. The results on the respondent's own religion in 1990 show that protestants (and those belonging to other religious communities) tend to be more (less) likely to stress the relevance of luck than those without on religious denomination. The Dresden-dummy again remains robust.

[239] Using the father's instead of the mother's religion does not change the results.

Table 14.11: Effort pays off (GDR, late 1980s): additional control variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dresden	-0.0662***	-0.1035***	-0.0630***	-0.0742***	-0.0426***	-0.0806***	-0.0609***	-0.0836***
	(0.0171)	(0.0181)	(0.0176)	(0.0066)	(0.0134)	(0.0294)	(0.0210)	(0.0297)
Industrial Production	0.0006							
	(0.0059)							
Working age population		-0.0213***						
		(0.0066)						
High educated workers			-0.0062***					
			(0.0011)					
Border district				-0.0103				
				(0.0236)				
Distance to Berlin				0.0001				
				(0.0003)				
Theater visitors (/1000)					-0.1009***			
					(0.0210)			
Theater						0.0113		
						(0.0414)		
Cinema							-0.0197**	
							(0.0083)	
Museum								0.0681**
								(0.0330)
Pseudo R^2	0.0190	0.0207	0.0213	0.0191	0.0231	0.0230	0.0195	0.0254
Observations	2517.0000	2517.0000	2517.0000	2517.0000	2517.0000	826.0000	2509.0000	826.0000

Notes: Probit regressions (average marginal effects are shown). Based on the specification presented in the second column of Table 14.6. For further information on included controls see Table 14.6. Robust standard errors in parentheses, clustered at district level. ***/**/* denotes significance at the 1%/5%/10% level.

Table 14.12: Luck matters for success (FRG 1994-99): additional control variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dresden	0.0358***	0.0393***	0.0367***	0.0312***	0.0357***	0.0348***	0.0678***	0.0490***
	(0.0118)	(0.0137)	(0.0109)	(0.0110)	(0.0115)	(0.0108)	(0.0161)	(0.0119)
Population density		0.0001						
		(0.0001)						
Inhabitants older than 65			0.0010					
			(0.0063)					
Unemployment rate (regional planning unit)				0.0111***				
				(0.0031)				
Average industrial wage					0.0000			
					(0.0000)			
GDP per capita						-0.0027		
						(0.0027)		
Mother: Catholic							0.0710**	
							(0.0303)	
Mother: Protestant							0.0510***	
							(0.0198)	
Mother: Other							0.0870**	
							(0.0402)	
Respondent (1990): Catholic								-0.0065
								(0.0274)
Respondent (1990): Protestant								0.0324*
								(0.0178)
Respondent (1990): Other								-0.0702*
								(0.0360)
Pseudo R2	0.0787	0.0788	0.0787	0.0796	0.0787	0.0787	0.0631	0.0806
Observations	5394	5394	5394	5394	5394	5394	2274	9212

Notes: Probit regressions (average marginal effects are shown). Based on the specification presented in the second column of Table 14.7. For further information on included controls see Table 14.7. Omitted category in the specifications (8) and (9) is no religion. Robust standard errors in parentheses, clustered at district level. ***/**/* denotes significance at the 1%/5%/10% level.

14.6.3 Additional insights into the role of Western television

The main objective of East German television was the indoctrination of the audience to alter their attitudes toward the GDR and socialism. Kern and Hainmueller (2009) analyze - based on GDR survey data - how access to West German television has affected attitudes toward the GDR in the late 1980s. They find that Western television contributed to a more positive assessment of different aspects of life in the GDR. Their basic explanation for this is that Western television made life in the GDR more bearable, which increased general satisfaction and made East Germans less critical toward the GDR regime and realities of socialism. This is in line with my argument that West German television affected East Germans' beliefs mainly by presenting different world views and values in its entertainment programs. Insofar, Kern and Hainmüller's and my work shed a light on different aspects of entertainment provided by television.

Though the effect of Western television on economic beliefs persisted during the 1990s, this must not be the case for the attitudes toward the GDR. If the main contribution of Western television was the entertainment of East Germans, the effect of different access to these broadcasts should not persist once everyone obtains the opportunity to watch and the situation in the GDR actually changes. Thus, I complement the analysis of Kern and Hainmueller (2009) by testing empirically whether the attitudes toward the GDR are still different between individuals from Dresden and other parts of the GDR after the reunification process started.

The empirical results presented in Table 14.13 confirm the earlier finding that before reunification, individuals without access to Western television were more skeptical toward several aspects of life in the GDR. Those living in the district of Dresden are significantly less content with the quality of reporting by state-controlled GDR media, less satisfied with life in the GDR in general, and significantly less optimistic about the future development of the economy and democracy in socialist states. Furthermore, the findings indicate a significantly positive relationship between access to Western television and the agreement with the Marxist-Leninist ideology.

Table 14.14 presents the findings of the analysis using data from the SOEP for the 1990s to test the persistence of differential attitudes after the reunification. In summer 1990, soon after the inner-German border was opened, no significant differences in the assessment of the social security and the democracy in the GDR are observable.

However, individuals from the Dresden-district are relatively more satisfied with the standard of living in East Germany after reunification. While individuals who

had lived in the district of Dresden before reunification and those from other parts of the GDR do not differ significantly with respect to their general happiness during the 1990s, those from Dresden are more optimistic toward their future life happiness.

Table 14.13: Attitudes toward the GDR and socialism, GDR, late 1980s

	(1) GDR media	(2) Life GDR	(3) Socialist economies	(4) Socialist democracy	(5) Marx-Lenin
Dresden	-0.1571***	-0.0530***	-0.0852***	-0.0850**	-0.0708***
	(0.0193)	(0.0066)	(0.0204)	(0.0246)	(0.0118)
Age	-0.0023	-0.0055	-0.0470***	-0.0173	0.0432***
	(0.0115)	(0.0083)	(0.0064)	(0.0144)	(0.0119)
Age^2	0.0001	0.0001	0.0007***	0.0003	-0.0005**
	(0.0002)	(0.0001)	(0.0001)	(0.0002)	(0.0002)
Female	0.1538***	0.0379***	0.0749***	0.0663**	0.1349***
	(0.0314)	(0.0136)	(0.0194)	(0.0225)	(0.0327)
Married	-0.0649***	-0.0142	-0.0035	-0.0159	0.0157
	(0.0173)	(0.0297)	(0.0186)	(0.0209)	(0.0276)
Widowed or divorced	0.0155	-0.0246	-0.0239	0.0162	0.0274*
	(0.0273)	(0.0396)	(0.0581)	(0.0699)	(0.0131)
Children	0.0422	0.0216	0.0510	0.0634**	-0.0325
	(0.0321)	(0.0213)	(0.0410)	(0.0265)	(0.0344)
University degree	-0.1933***	0.0122	-0.0484*	-0.0943	-0.0441*
	(0.0318)	(0.0363)	(0.0247)	(0.0507)	(0.0222)
Net income	0.0128	-0.0003	0.0039	0.0078	0.0065
	(0.0104)	(0.0032)	(0.0052)	(0.0042)	(0.0072)
Intermediate education	-0.0836***	0.0565***	-0.0398	-0.0566	0.0791
	(0.0323)	(0.0139)	(0.0313)	(0.0381)	(0.0438)
High education	-0.0776	0.0706	-0.0851***	-0.0407	0.2301***
	(0.0515)	(0.0442)	(0.0205)	(0.0413)	(0.0433)
Population density	-0.0002**	-0.0001*	-0.0001	-0.0001	-0.0002***
	(0.0001)	(0.0000)	(0.0001)	(0.0001)	(0.0001)
Industrial employment	-0.0139*	-0.0063**	-0.0116	-0.0070	-0.0174***
	(0.0073)	(0.0028)	(0.0083)	(0.0100)	(0.0045)
Agricultural employment	-0.0222	-0.0053	-0.0143	-0.0103	-0.0270**
	(0.0134)	(0.0051)	(0.0159)	(0.0192)	(0.0077)
Pseudo R2	0.0437	0.0488	0.0279		
Observations	2571	2603	2607	2603	2598

Notes: Probit regressions (average marginal effects are shown). The dependent variables equal one for respondents who (1) feel well informed by GDR media (GDR MEDIA), (2) like living in the GDR (LIFE GDR), are confident in the development of (3) the economy of socialist countries (SOCIALIST ECONOMIES) and (4) the socialist democracy in the GDR (SOCIALIST DEMOCRACY), and (5) agree with the Marxist-Leninist world view (MARX-LENIN). ***/**/* denotes significance at the 1%/5%/10% level.

Table 14.14: Attitudes toward the GDR and happiness, FRG, 1990s

	(1) Social security GDR (1990)	(2) Democracy GDR (1990)	(3) Life standard GDR (1991-94)	(4) Happiness (1990-99)	(5) Expected happiness in 5 yrs. (1990-99)
Dresden	0.0218	-0.0047	0.0496**	-0.0007	0.0319**
	(0.0248)	(0.0353)	(0.0213)	(0.0132)	(0.0144)
Age	-0.0089	-0.0155	-0.0151**	-0.0321***	-0.0001
	(0.0163)	(0.0185)	(0.0065)	(0.0080)	(0.0054)
Age^2	0.0001	0.0003	0.0002*	0.0005**	-0.0003*
	(0.0004)	(0.0004)	(0.0001)	(0.0002)	(0.0001)
Age^3	-0.0000	-0.0000	-0.0000	-0.0000	0.0000**
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Female	0.0081	-0.0140	-0.0049	-0.0048	0.0011
	(0.0137)	(0.0109)	(0.0077)	(0.0073)	(0.0071)
Father's education	-0.0075	-0.0224	-0.0218***	0.0022	0.0124*
	(0.0189)	(0.0240)	(0.0059)	(0.0052)	(0.0064)
Married	0.0355	0.0036	-0.0326**	0.0481***	0.0074
	(0.0355)	(0.0385)	(0.0165)	(0.0164)	(0.0212)
Married but separated	0.0626	-0.0093	-0.1077*	-0.0946***	0.0102
	(0.1226)	(0.0818)	(0.0559)	(0.0286)	(0.0426)
Widowed or divorced	-0.0228	-0.0220	-0.0287	0.0267	0.0323*
	(0.0532)	(0.0534)	(0.0240)	(0.0193)	(0.0168)
Not employed	-0.0697	0.0514	-0.0533*	-0.0335	0.0313
	(0.0451)	(0.0389)	(0.0326)	(0.0405)	(0.0268)
Retired	0.0741**	0.1123***	-0.0085	0.0111	0.0273
	(0.0376)	(0.0385)	(0.0161)	(0.0224)	(0.0171)
Unemployed			-0.0146*	-0.1622***	-0.0674***
			(0.0082)	(0.0092)	(0.0132)
Self employed	0.0624	0.0149	0.0119	0.0062	0.0897***
	(0.0574)	(0.0523)	(0.0191)	(0.0183)	(0.0221)
Civil servant			0.0117	0.1035**	0.1451*
			(0.0480)	(0.0478)	(0.0740)
White collar	-0.0050	0.0248	-0.0006	0.0460***	0.0505**
	(0.0163)	(0.0270)	(0.0130)	(0.0141)	(0.0247)
University degree	-0.0606**	0.0120	-0.0113	0.0093	0.0027
	(0.0263)	(0.0366)	(0.0114)	(0.0171)	(0.0108)
High education	-0.0759	0.0466	-0.0716***	0.0087	0.0122
	(0.0537)	(0.0626)	(0.0194)	(0.0425)	(0.0286)
Intermediate education	-0.0188	0.0514	-0.0352**	0.0153	0.0107
	(0.0449)	(0.0429)	(0.0177)	(0.0276)	(0.0218)
No. persons in household	-0.0083	-0.0099	0.0123*	-0.0475***	-0.0157
	(0.0190)	(0.0161)	(0.0069)	(0.0120)	(0.0113)
No. children in household	0.0155	0.0141	-0.0065	0.0416***	0.0144**
	(0.0254)	(0.0182)	(0.0085)	(0.0073)	(0.0064)
Log. household income				0.1613***	0.1060***
				(0.0151)	(0.0151)
Low household income	0.0342	0.0289	-0.0077		
	(0.0461)	(0.0391)	(0.0150)		
Intermed. household income	0.0203	0.0270	-0.0105		
	(0.0268)	(0.0386)	(0.0123)		
Currently living in West Germany			0.1867***	0.1028*	0.1728***
			(0.0510)	(0.0556)	(0.0556)
Unemployment experience	0.0125	-0.0395*	-0.0084*	-0.0296***	-0.0229***
	(0.0102)	(0.0234)	(0.0051)	(0.0054)	(0.0042)
Unemployment rate (state level)	0.0256*	0.0149	0.0215***	0.0023	0.0043
	(0.0141)	(0.0189)	(0.0054)	(0.0054)	(0.0054)
Year FE	NO	NO	YES	YES	YES
Pseudo R2	0.0145	0.0118	0.0404	0.0517	0.0682
Observations	2994	2991	11747	20011	19927

Notes: Probit regressions (average marginal effects are shown). The dependent variables equals one for respondents who are satisfied with (1) the social security (Social security GDR, or (2) the democracy in the GDR (Democracy GDR), the (3) general standard of living in the GDR (Life standard), and who stated to be (4) satisfied with life in general (Happiness) or (5) expect to be satisfied in five years (Expected happiness). The unemployment rate is measured as the average unemployment rate in the state of residence between 1991 and 1995 in the analysis of social security and democracy in the GDR. Robust standard errors in parentheses, clustered at the level of the regional planning units or in case of (expected) happiness at Nuts2-level. ***/**/* denotes significance at the 1%/5%/10% level.

14.7 Conclusion

This study exploits a natural experiment on West German television reception in the former GDR to analyze its impact on East Germans' beliefs before and up to one decade after reunification. I show that the availability of Western television has made East Germans more inclined to believe that effort rather than luck determines success in life. Moreover, Western television also affected attitudes toward the GDR and socialism. While the exposure to West German media is reflected in personal beliefs up to ten years after reunification, differences in attitudes diminished soon after the fall of the Berlin wall.

I argue that the regime-stabilizing effect of Western television and its impact on East Germans' beliefs reflect two different aspects of entertainment programs (e.g. movies or soap operas). In the short run, these programs made life in real-existing socialism more bearable. Beyond entertainment, Western soap operas and movies also provided additional signals about the relationship between effort (as opposed to predetermined factors such as luck) and success and by this affected the corresponding beliefs of East Germans. Those elementary beliefs remain rather stable once they are formed in a critical age (e.g. during early adulthood; see Giuliano and Spilimbergo, 2009), which can explain the persistence of the effect of differential access to Western television during the 1990s.

It might be true that the main findings of this paper are driven by some Dresden-specific factor. Given the robustness of the result to various additional tests, I am, however, confident that West German television has indeed affected the beliefs and attitudes of East Germans. Hence, state-controlled media seem to have been a part of socialization that has left its marks on East Germans minds.

This analysis is based on exposure to Western television in the GDR and, thus, on a specific situation. Still, it indicates that the role of information provided by mass media should not be overlooked for belief formation. Since beliefs on the drivers of success are also correlated with voters' preferences for redistribution, television may affect policy outcomes even if that may not be intended but may just be a byproduct of providing entertainment.

Bibliography

Acemoglu, D. and D. Autor (2010): "Skills, Tasks and Technologies: Implications for Employment and Earnings," *NBER Working Paper Series*, 16082.

——— (2012): "What does Human Capital do? A Review of Goldin and Katz's Race between Education and Technology," *Journal of Economic Literature*, 50, 426–463.

Ackert, L. F., J. Martinez-Vazquez, and M. Rider (2007): "Social Preferences and Tax Policy Design: Some Experimental Evidence," *Economic Inquiry*, 43, 487–501.

Ai, C. and E. C. Norton (2003): "Interaction Terms in Logit and Probit Models," *Economic Letters*, 80, 123–129.

Alderson, A. S. and F. Nielsen (2002): "Globalization and the Great U-Turn: Income Inequality Trends in 16 OECD Countries," *American Journal of Sociology*, 107, 1244–99.

Alesina, A. and G.-M. Angeletos (2005): "Fairness and Redistribution," *American Economic Review*, 95, 961–980.

Alesina, A. and N. Fuchs-Schündeln (2007): "Good-Bye Lenin (or Not?): The Effect of Communism on People's Preferences," *American Economic Review*, 97, 1507–1528.

Alesina, A. and P. Giuliano (2009): "Preferences for Redistribution," *NBER Working Papers*, 14825.

Alesina, A. and E. Glaeser (2004): *Fighting Poverty in the US and Europe: A World of Difference*, New York: Oxford University Press.

Alesina, A., E. Glaeser, and B. Sacerdote (2001): "Why Doesn't the United States Have a European Style Welfare State?" *Brookings Papers on Economic Activity*, 2, 187–254.

Alesina, A. and E. La Ferrara (2005): "Preferences for Redistribution in the Land of Opportunities," *Journal of Public Economics*, 89, 897–931.

Anand, P. (2001): "Procedural Fairness in Economic and Social Choice: Evidence from a Survey of Voters," *Journal of Economic Psychology*, 22, 247–270.

Armingeon, K., D. Weisstanner, S. Engler, P. Potolidis, and M. Gerber (2012): *Comparative Political Data Set I 1960-2010*, Bern: Institute of Political Science, University of Bern.

Atkinson, A. B. (2002): "Income Inequality and the Welfare State in a Global Era," Mimeo.

——— (2008): *The Changing Distribution of Earnings in OECD Countries*, New York: Oxford University Press.

Atkinson, A. B., A. Brandolini, P. van der Laan, and T. M. Smeeding (2000): "Producing Time Series Data for Income Distribution : Sources, Methods, and Techniques," in *Paper prepared for the 26th General Conference of The International Association for Research in Income and Wealth Cracow, Poland, 27 August to 2 September 2000.*

Atkinson, A. B., L. Rainwater, and T. M. Smeeding (1995): "Income Distribution in Advanced Economies: Evidence from LIS," *LIS Working Paper*, No.120.

Autor, D. H. (2013): "The 'Task Approach' to Labor Markets: An Overview," Mimeo.

Babcock, L. and G. Loewenstein (1997): "Explaining Bargaining Impasse: The Role of Self-Serving Biases," *Journal of Economic Perspectives*, 11, 109–126.

Baron, J. and S. Kemp (2004): "Support for Trade Restrictions, Attitudes, and Understanding of Comparative Advantage," *Journal of Economic Psychology*, 25, 565–580.

Barro, R. J. and J.-W. Lee (1993): "International Comparisons of Educational Attainment," *Journal of Monetary Economics*, 32, 363–394.

——— (1996): "International Measures of Schooling Years and Schooling Quality," *The American Economic Review*, 86, 218–223.

——— (2000): "International Data on Educational Attainment Updates and Implications," *NBER Working Paper Series*, No. 7911.

——— (2012): "A new Data set of Educational Attainment in the World, 1950-2010," *Journal of Development Economics*, forthcoming.

Bassanini, A. and R. Duval (2009): "Unemployment, Institutions, and Reform Complementarities: Re-assessing the Aggregate Evidence for OECD Countries," *Oxford Review of Economic Policy*, 25, 40–59.

Becker, G. S. (1962): "Investment in Human Capital: A Theoretical Analysis," *Journal of Political Economy*, 70, 9–49.

Benabou, R. and E. A. Ok (2001): "Social Mobility and the Demand for Redistribution: The POUM Hypothesis," *Quarterly Journal of Economics*, 116, 447–487.

Benabou, R. and J. Tirole (2003): "Intrinsic and Extrinsic Motivation," *Review of Economic Studies*, 70, 489–520.

——— (2006a): "Belief in a Just World and Redistributive Politics," *The Quarterly Journal of Economics*, 121, 699–746.

——— (2006b): "Incentives and Prosocial Behavior," *American Economic Review*, 96, 1652–1678.

Bergh, A. and T. Nilsson (2010): "Do Liberalization and Globalization Increase Income Inequality?" *European Journal of Political Economy*, 26, 488–505.

Berman, E., J. Bound, and Z. Griliches (1994): "Changes in the Demand for Skilled Labor within U.S. Manufacturing: Evidence from the Annual Survey of Manufactures," *Quarterly Journal of Economics*, 109, 367–397.

Bernand, A. B. and J. B. Jensen (1997): "Exporters, Skill Upgrading, and the Wage gap," *Journal of International Economics*, 42, 3–31.

Bernard, A. B., J. B. Jensen, S. J. Redding, and P. K. Schott (2007): "Firms in International Trade," *Journal of Economic Perspectives*, 21, 105–130.

Bischoff, I., F. Heinemann, and T. Hennighausen (2008): "Individual Determinants of Social Fairness Assessments - The Case of Germany," *ZEW Discussion Paper*, 063.

Blanchard, O. and T. Philippon (2003): "The Decline of Rents, and the rise and fall of European Unemployment," Mimeo.

Blankart, C. B. (2008): *Öffentliche Finanzen in der Demokratie*, München: Vahlen Verlag.

Blekesaune, M. and P. E. Solem (2005): "Working Conditions and Early Retirement," *Research on Aging*, 27, 3–30.

Blendon, R., J. Benson, M. Brodie, R. Morin, D. Altman, D. Gitterman, M. Brossard, and M. James (1997): "Bridging the gap Between the Public's and the Economists' Views of the Economy," *Journal of Economic Perspectives*, 11, 105–118.

Blinder, A. S. and A. B. Krueger (2004): "What Does the Public Know about Economic Policy, and How Does It Know It?" *Brookings Papers on Economic Activity*, 35, 327–397.

Boeri, T., A. Börsch-Supan, and G. Tabellini (2001): "Would you like to Shrink the European Welfare State? A Survey of European Citizens," *Economic Policy*, 16, 9–50.

——— (2002): "Pension Reforms and the Opinions of European Citizens," *American Economic Review*, 92, 396–401.

Boeri, T., J. Conde-Ruiz, and V. Galasso (2004): "Cross-Skill Redistribution and the Tradeoff between Unemployment Benefits and Employment Protection," *IZA Discussion Paper No. 1371*.

Boeri, T. and G. Tabellini (2012): "Does Information Increase Political Support for Pension Reform?" *Public Choice*, 150, 327–362.

Boockmann, B. and R. Vaubel (2009): "The Theory of Raising Rivals' Costs and Evidence from the International Labour Organisation," *The World Economy*, 32, 862–887.

Borjas, G. J., R. B. Freeman, and L. F. Katz (1992): "On the Labor Market Effects of Immigration and Trade," in *Immigration and the Work Force*, ed. by G. Borjas and R. Freeman, University of Chicago Press and NBER, 213–244.

Börsch-Supan, A. (1992): "Population Aging, Social Security Design, and Early Retirement," *Journal of Institutional and Theoretical Economics*, 148, 533–557.

Börsch-Supan, A., S. Kohnz, and R. Schnabel (2007): "Budget Effects of Pension Reform in Germany," in *Social Security Programs and Retirement Around the World: Fiscal Implications*, ed. by J. Gruber and D. Wise, Chicago: University of Chicago Press.

Börsch-Supan, A., R. Schnabel, S. Kohnz, and G. Mastrobuoni (2004): "Micro-modelling of Retirement Decisions in Germany," in *Social Security Programs and Retirement around the World: Fiscal Implications*, ed. by J. Gruber and D. Wise, Chicago: University of Chicago Press.

Brandolini, A. and A. B. Atkinson (2001): "Promise and Pitfalls in the Use of "Secondary" Data-Sets: Income Inequality in OECD Countries as a Case Study," *Journal of Economic Literature*, 39, 771–779.

Breyer, F. and M. Kifmann (2002): "Incentives to Retire Later - a Solution to the Social Security Crisis?" *Journal of Pension Economics and Finance*, 1, 111–130.

Buchanan, J. and G. Tullock (1962): *The Calculus of Consent*, Ann Arbor: Michigan University Press.

Bundesinstitut für Bau-, Stadt- und Raumforschung (BBSR) (various years): *Indikatoren und Karten zur Raum- und Stadtentwicklung (INKAR)*, Bonn.

Burgoon, B. (2001): "Globalization and Welfare Compensation: Disentangling the Ties that Bind," *International Organization*, 55, 509–551.

Burstein, A. and J. Vogel (2010): "Globalization, Technology, and the Skill Premium: A Quantitative Analysis," *NBER Working Paper Series*, 16459.

Bursztyn, L. and D. Cantoni (2012): "A tear in the Iron Curtain: The Impact of Western Television on Consumption Behavior," *Munich Discussion Paper No. 2012-19*.

Canberra Group (2001): *Expert Group on Household Income Statistics: Final Report and Recommendations*, Ottawa.

Caplan, B. (2002): "Systematically Biased Beliefs about Economics: Robust Evidence of Judgemental Anomalies from the Survey of Americans and Economists on the Economy," *The Economic Journal*, 112, 433–458.

Champbell, D. T. and D. W. Fiske (1959): "Convergent and Discriminant Validation by the Multitrait-Multimethod Matrix," *Psycholigical Bulletin*, 56, 81–105.

Checci, D. and C. Garcia-Penalosa (2010): "Labour Market Institutions and the Personal Distribution of Income in the OECD," *Economica*, 77, 413–450.

Choi, M. (2001): "Threat Effect of Foreign Direct Investment on Labor Union Wage Premium," *PERI Working Paper*, 27.

Chong, A., S. Duryea, and E. La Ferrara (2008): "Soap Operas and Fertility: Evidence from Brazil," *CEPR Discussion Papers*, 6785.

Chong, A. and E. La Ferrara (2009): "Television and Divorce: Evidence from Brazilian Novelas," *Journal of the European Economic Association*, 7, 458–468.

Corneo, G. and H. P. Grüner (2002): "Individual Preferences for Political Redistribution," *Journal of Public Economics*, 83, 83–107.

Davidson, C. and S. J. Matusz (2000): "Globalization and Labour-Market Adjustment: How Fast and at What Costs," *Oxford Review of Economic Policy*, 16, 42–56.

Davis, D. and J. Harrigan (2007): "Good Jobs, Bad Jobs, and Trade Liberalization," *NBER Working Paper Series*, 13139.

Davis, D. R. (1998): "Does European Unemployment Prop up American Wages? National Labor Markets and Global Trade," *The American Economic Review*, 88, 478–494.

Deci, E. L. (1971): "Effects of Externally Mediated Rewards on Intrinsic Motivation," *Journal of Personality and Social Psychology*, 18, 105–115.

Delaney, L. and F. O. O'Toole (2008): "Individual, Household and Gender Preferences for Social Transfers," *Journal of Economic Psychology*, 29, 348–359.

DellaVigna, S. and E. Kaplan (2007): "The Fox News Effect: Media Bias and Voting," *Quarterly Journal of Economics*, 122, 1187–1234.

Devesa-Carpio, J. E. and M. Devesa-Carpio (2010): "The cost and actuarial imbalance of pay-as-you-go systems: the case of Spain," *Journal of Economic Policy Reform*, 13, 259–276.

Di Tella, R., S. Galiani, and E. Schargrodsky (2007): "The Formation of Beliefs: Evidence from the Allocation of Land Titles to Squatters," *Quarterly Journal of Economics*, 122, 209–241.

Di Tella, R. and R. MacCulloch (2005): "The Consequences of Labor Market Flexibility: Panel Evidence based on Survey data," *European Economic Review*, 49, 1225–1259.

DiNardo, J., N. M. Fortin, and T. Lemieux (1996): "Labor Market Institutions and the Distribution of Wages, 1973-1992: A Semiparametric Approach," *Econometrica*, 64, 1001–1044.

Dolan, P., R. Edlin, A. Tschuchiya, and A. Wailoo (2007): "It ain't what you do, it's how you do it: Characteristics of Procedural Justice and their Importance in Social Decision Making," *Journal of Economic Behavior and Organization*, 64, 157–170.

Dreher, A. (2006): "The Influence of Globalization on Taxes and Social Policy: an Empirical Analysis for OECD Countries," *European Journal of Political Economy*, 22, 179–201.

Dreher, A. and N. Gaston (2008): "Has Globalization Increased Inequality," *Review of International Economics*, 16, 516–536.

Dreher, A., N. Gaston, and P. Martens (2008): *Measuring Globalisation: Gauging Its Consequences*, New York: Springer.

Edlund, J. (2003): "Attitudes Towards Taxation: Ignorant and Incoherent?" *Scandinavian Political Studies*, 26, 145–167.

Egger, H. and U. Kreickemeier (2009): "Firm Heterogeneity and the Labor Market Effects of Trade Liberalization," *International Economic Review*, 50, 187–216.

Egger, P., D. Greenaway, and T. Seidel (2001): "Rigid Labour Markets with Trade and Capital Mobility: Theory and Evidence," *Canadian Journal of Economics*, 44, 509–540.

Enikolopov, R., M. Petrova, and E. Zhuravskaya (2011): "Media and Political Persuasion: Evidence from Russia," *American Economic Review*, 101, 3253–3285.

Etzkorn, K. P. and H.-J. Stiehler (1998): "The 'Valley of the Clueless' - Results From an Historical Experiment," *The European Journal of Communication Research*, 23, 271–298.

Faravelli, M. (2007): "How Context Matters: A Survey Based Experiment on Distributive Justice," *Journal of Public Economics*, 91, 1399–1422.

Feenstra, R. (1998): "Integration and Disintegration of Production in the Global Economy," *Journal of Economic Perspectives*, 12, 31–50.

——— (2004): *Advanced International Trade: Theory and Evidence*, Princeton and Oxford: Princeton University Press.

Feenstra, R. and G. H. Hanson (1996): *Foreign Investment, Outsourcing, and Relative Wages*, Cambridge (Mass): MIT Press, 89–127.

——— (1999): "The Impact of Outsourcing and High Technology Capital on Wages: Estimates for the U.S., 1979-1990," *Quarterly Journal of Economics*, 114, 907–940.

Fehr, E. and S. Gächter (2002): "Altruistic Punishment in Humans," *Nature*, 415, 137–140.

Fehr, E. and K. Schmidt (1999): "A Theory of Fairness, Competition, and Cooperation," *Quarterly Journal of Economics*, 114, 817–868.

Felbermayr, G., J. Prat, and H.-J. Schmerer (2011a): "Globalization and Labor Market Outcomes: Wage Bargaining, Search Frictions, and Firm Heterogeneity," *Journal of Economic Theory*, 146, 39–73.

——— (2011b): "Trade and Unemployment: What do the Data say?" *European Economic Review*, 55, 741–758.

FILER, R. AND M. HONIG (2005): "Endogenous Pensions and Retirement Behavior," *CESifo Working Paper No. 1547*.

FONG, C. (2001): "Social Preferences, Self Interest, and the Demand for Redistribution," *Journal of Public Economics*, 80, 225–246.

FRANZ, W. (2006): "Bewertung Hartz IV und Ein-Euro-Jobs durch den Sachverständigenrat," *Zeitschrift für Wirtschaftspolitik*, 55, 177–181.

FREEMAN, R. B. (1995): "Are Your Wages Set in Beijing?" *Journal of Economic Perspectives*, 9, 15–32.

FREY, B. (1997a): *Markt und Motivation: Wie ökonomische Arbeitsanreize die (Arbeits-)Moral verdrängen*, München: Vahlen.

——— (1997b): "On the Relationship Between Intrinsic and Extrinsic work Motivation," *International Journal of Industrial Organization*, 15, 427–439.

——— (2008): *Motivation Crowding Theory - a new Approach to Behaviour*, Canberra: Roundtable Proceedings, Productivity Commission, 37–54.

FREY, B. AND R. JEGEN (2001): "Motivation Crowding Theory: A Survey of Empirical Evidence," *Journal of Economic Surveys*, 15, 589–611.

FUEST, C. AND B. HUBER (2001): "Tax Progression and Human Capital in Imperfect Labour Markets," *German Economic Review*, 2, 1–18.

FUEST, C., B. HUBER, AND J. MINTZ (2005): "Capital Mobility and Tax Competition," *Foundations and Trends in Microeconomics*, 1, 1–62.

GASTON, N. AND D. TREFLER (1995): "Union Wage Sensitivity to Trade and Protection: Theory and Evidence," *Journal of International Economics*, 39, 1–25.

GDR STATISTICAL OFFICE (various years): *Statistical Yearbook of the German Democratic Republic*, Berlin: Staatsverlag der Deutschen Demokratischen Republik.

GEISHECKER, I. AND H. GÖRG (2007): "Winners and Losers: A Micro-Level Analysis of International and Wages," *CEPR Discussion Paper Series*, No.6484.

Gentzkow, M. A. and J. M. Shapiro (2004): "Media, Education and Anti-Americanism in the Muslim World," *Journal of Economic Perspectives*, 18, 117–133.

Giuliano, P. and A. Spilimbergo (2009): "Growing Up in a Recession: Beliefs and the Macroeconomy," *NBER Working Paper*, 15321.

Goldberg, P. K. and N. Pavnic (2007): "Distributional Effects of Globalization in Developing Countries," *Journal of Economic Literature*, XLV, 39–82.

Goldin, C. and L. F. Katz (2007a): "Long-Run Changes in the Wage Structure: Narrowing, Widening, Polarizing," *Brookings Papers on Economic Activity*, 2:2007, 135–165.

——— (2007b): "The Race between Education and Technology: The Evolution of U.S. Educational Wage Differentials, 1890 to 2005," *NBER Working Paper Series*, 12984.

Gornick, J. C., B. H. Ragnarsdottir, and S. Kostecki (2013): "LIS, Cross-National Data Center - An Overview," *LIS Technical Working Paper Series*, No. 5.

Gottschalk, P. and T. M. Smeeding (2000): "Empirical Evidence on Income Inequality in Industrialized Countries," in *Handbook of Income Distribution*, ed. by A. Atkinson and F. Bourguignon, Amsterdam: Elsevier, vol. 1, chap. 5, 261–307.

Greenaway, D. and D. Nelson (2001): "Globalisation and Labour Markets: Literature Review and Synthesis," *University of Nottingham, GEP Discussion Paper*, 29.

Griliches, Z. (1969): "Capital-Skill Complementarity," *Review of Economics and Statistics*, 51, 465–468.

Grossman, G. M. and E. Rossi-Hansberg (2008): "Trading Tasks: A Simple Theory of Offshoring," *American Economic Review*, 98, 1978–1997.

Gruber, J. and D. A. Wise (2004): *Social Security Programs and Retirement Around the World: Micro-estimation*, Chicago: University of Chicago Press.

——— (2007): *Social Security Programs and Retirement Around the World: Fiscal Implications*, Chicago: University of Chicago Press.

Grundmann, S. (1997): "Territorialplanung in der DDR: Indikatoren zur Analyse regionaler Disparitäten - Die sozial-räumliche Struktur der DDR in den 80er Jahren," in *Regionale Strukturen im Wandel*, ed. by A. Becker, Opladen, 7–44.

Gwartney, J., R. Lawson, and J. Hall (2012): "Economic Freedom Dataset," published in Economic Freedom of the World: 2012 Annual Report.

Harrigan, J. and A. Reshef (2011): "Skill Biased Heterogeous Firms, Trade Liberalization, and the Skill Premium," *NBER Working Paper Series*, 17604.

Harrison, A., J. McLaren, and M. S. McMillan (2010): "Recent Findings on Trade and Inequality," .

Heineck, G. and B. Süssmuth (2010): "A Different Look at Lenin's Legacy: Trust, Risk, Fairness and Cooperativeness in the Two Germanies," *IZA Discussion Paper No. 5219*.

Heinemann, F. (2008): "Is the Welfare State Self-Destructive? A Study of Government Benefit Morale," *Kyklos*, 61, 237–257.

Heinemann, F., I. Bischoff, and T. Hennighausen (2009): "Choosing from the Reform Menu Card - Individual Determinants of Labour Market Policy Preferences," *Jahrbücher für Nationalökonomie und Statistik*, 229, 180–197.

Heinemann, F., M. Förg, D. Frey, E. Jonas, W. Rotfuss, E. Traut-Mattausch, and P. Westerheide (2008): *Psychologie, Wachstum und Reformfähigkeit*, vol. 88 of *Schriftenreihe des ZEW*, Baden-Baden: Nomos.

Heinemann, F., T. Hennighausen, and M.-D. Moessinger (2013): "Intrinsic Work Motivation and Pension Reform Preferences," *Journal of Pension Economics and Finance*, 12, 190–217.

Heinemann, F., T. Hennighausen, E. Traut-Mattausch, M. Kocher, E. Jonas, and D. Frey (2011): *Gerechtigkeitswahrnehmung von Steuer- und Sozialsystemreformen*, vol. 100 of *ZEW Wirtschaftsanalysen*, Baden-Baden: Nomos.

Heinemann, F. and E. Janeba (2011): "Viewing Tax Policy through Party-Colored Glasses: What German Politicians Believe," *German Economic Review*, 12, 286–311.

Helbling, T., D. Hakura, and X. Debrun (2004): *Forstering Structural Reforms in Industrial Countries*, Washington D.C., 103–146.

Helpman, E., M. Melitz, and S. Yeaple (2004): "Export versus FDI with Heterogenous Firms," *American Economic Review*, 94, 900–316.

Hennighausen, T. (2012): "Exposure to Television and Individual Beliefs: Evidence from a Natural Experiment," *ZEW Discussion Paper*, 12-078.

——— (2013): "Exposure to Television and Individual Beliefs: Evidence from a Natural Experiment," *SOEP Papers on Multidisciplinary Panel Data Research*, 535.

Hennighausen, T. and F. Heinemann (forthcoming): "Don't Tax Me? Determinants of Individual Attitudes Toward Progressive Taxation," *German Economic Review*.

Hesse, K. R. (1988): *Westmedien in der DDR. Nutzung, Image und Auswirkungen bundesrepublikanischen Hörfunks und Fernsehens*, Köln.

Hettich, W. and S. Winer (1997): "The Political Economy of Taxation," in *Perspectives on Public Choice*, ed. by D. Mueller, Cambridge, 481–505.

Hickman, D. C. and W. W. Olney (2011): "Globalization and Investment in Human Capital," *Industrial and Labor Relations Review*, 64, 654–672.

Hite, P. and M. Roberts (1991): "An Experimental Investigation of Taxpayer Judgements in Rate Structure in the Individual Income Tax System," *Journal of American Taxation Association*, 13, 47–63.

Howell, D. R. and M. Rehm (2009): "Unemployment Compensation and High European Unemployment: A Reassessment with new Benefit Indicators," *Oxford Review of Economic Policy*, 25, 60–93.

IMF (2012): "International Financial Statistics," *DSI International Statistical Yearbook*.

Janeba, E. (1998): "Tax Competition in Imperfectly Competitive Markets," *Journal of International Economics*, 44, 135–153.

——— (2007): "Exports, Unemployment and the Welfare State," *CESifo Working Paper Series*, 1977.

Jensen, R. and E. Oster (2009): "The Power of TV: Cable Television and Women's Status in India," *The Quarterly Journal of Economics*, 124, 1057–1094.

Johnson, G. E. (1997): "Changes in Earnings Inequality: The Role of Demand Shifts," *The Journal of Economic Perspectives*, 11, 41–54.

Johnson, G. E. and F. Stafford (1999): "The Labor Market Implications of International Trade," in *Handbook of Labor Economics*, ed. by O. Ashenfelder and D. Card, Elsevier Science Publisher B.V., vol. 3, chap. 34, 2215–2288.

Johnson, R. W. and E. Steuerle (2004): "Promoting work at Older ages: the role of Hybrid Pension Plans in an Aging Population," *Journal of Pension Economics and Finance*, 3, 157–177.

Kenworthy, L. (2008): *Jobs with Equality*, New York: Oxford University Press.

Kenworthy, L. and J. Pontusson (2005): "Rising Inequality and the Politics of Redistribution in Affluent Countries," *Perspectives on Politics*, 3, 449–471.

Kern, H. L. and J. Hainmueller (2009): "Opium for the Masses: How Foreign Media Can Stabilze Authorien Regimes," *Political Analysis*, 17, 377–399.

Kind, G. (1997): "Territorialentwicklung und Territorialplanung in der DDR: Ergebnisse und Auswirkungen auf die Raumstruktur Deutschlands," in *Regionale Strukturen im Wandel*, ed. by A. Becker, Opladen, 17–103.

Koeninger, W., M. Leonardi, and L. Nunziata (2007): "Labor Market Institutions and Wage Inequality," *Industrial and Labor Relations Review*, 60, 340–356.

Konow, J. (2003): "Which is the Fairest One of All? A Positive Analysis of Justice Theories," *Journal of Economic Literature*, 41, 1188–1239.

Krugman, P. (1980): "Scale Economics, Product Differentation and the Patterns of Trade," *American Economic Review*, 9, 469–479.

——— (1995): "Growing World Trade: Causes and Consequences," *Brookings Papers on Economic Activity*, 1995, 327–377.

Krusell, P., L. E. Ohanian, J.-V. Ríos-Rull, and G. L. Violante (2000): "Capital-Skill Complementarity and Inequality: A Macroeconomic Analysis," *Econometrica*, 68, 1029–1053.

Kurokawa, Y. (2010): "A Survey of Trade and Wage Inequality: Anomalies, Resolutions, and New Trends," *Tsukuba Economics Working Papers*, No. 2010-007.

Lachance, M.-E. (2008): "Pension Reductions: Can Welfare be Preserved by Delaying Retirement?" *Journal of Pension Economics and Finance*, 7, 157–177.

Lawrence, R. Z. and M. J. Slaughter (1993): "International Trade and American Wages in the 1980s: Giant Sucking Sound or Small Hiccup?" *Brookings Papers on Economic Activity. Microeconomics*, 1993, 161–226.

Lazear, E. P. (1979): "Why is there mandatory retirement?" *Journal of Political Economy*, 87, 1261–1284.

Lazear, E. P. and P. Oyer (2007): "Personnel Economics," *NBER Working Paper No. 13480*.

Lindbeck, A. (1995): "Welfare State Disincentives with Endogenous Habits and Norms," *Scandinavian Journal of Economics*, 97, 447–494.

Lindbeck, A. and D. J. Snower (1988): *The Insider-Outsider Theory of Employment and Unemployment*, Cambridge (Mass.): MIT Press.

Lindquist, M. J. (2005): "Capital–Skill Complementarity and Inequality in Sweden," *Scandinavian Journal of Economics*, 107, 711–735.

LIS (various years): "Luxembourg Income Study Database (multiple countries)," Http://www.lisdatacenter.org (Accessed May to July 2013).

Lynch, J. and M. Myrskylä (2009): "Always the Third Rail? Pension Income and Policy Preferences in European Democracies," *Comparative Political Studies*, 42, 1068 – 1097.

Machin, S. and J. Van Reenen (1998): "Technology and Changes in the Skill Structure: Evidence from Seven OECD Countries," *Quarterly Journal of Economics*, 113, 1215–1244.

Mahler, V. A. (2004): "Economic Globalization, Domestic Politics, and Income Inequality in the Developed Countries. A Cross-National Study," *Comparative Political Studies*, 37, 1025–1053.

Maretzke, S. (1991): "Tendenzen der Wanderungsentwicklung zwischen den alten und neuen Bundesländern im Zeitraum 1989 und 1990," in *Raumentwicklung in den alten und neuen Bundesländern. Arbeitsbeiträge zum Raumordnungsbericht der Bundesregierung 1991*, ed. by Bundesforschungsanstalt für Landeskunde und Raumordnung, Bonn, 10–21.

Meier-Pesti, K. and E. Penz (2008): "Sex or Gender? Expanding the Sex-Based View by Introducing Masculinity and Feminity as Predictors of Financial Risk Taking," *Journal of Economic Psychology*, 29, 180–196.

Melitz, M. J. (2003): "The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity," *Econometrica*, 71, 1695–1725.

Meltzer, A. and S. Richard (1981): "A Rational Theory of Size of Government," *Journal of Political Economy*, 89, 914–927.

Meyen, M. (2002): "Kollektive Ausreise? Zur Reichweite ost- und westdeutscher Fernsehprogramme in der DDR," *Publizistik*, 47, 200–220.

——— (2003): *Einschalten, Umschalten, Ausschalten? Das Fernsehen im DDR-Alltag*, Leipzig.

Meyer, J. P. and N. J. Allen (1991): "A Three-Component Conceptualization of Organizational Commitment," *Human Resource Managment Review*, 1, 61–89.

Milanovic, B. (2000): "The Median Voter Hypothesis, Income Inequality and Income Redistribution: An Empirical Test with the Required Data," *Luxembourg Income Study Working Paper*, No. 256.

Moene, K. and M. Wallerstein (2001): "Inequality, Social Insurance, and Redistribution," *American Political Science Review*, 95, 859–874.

——— (2003): "Earnings Inequality and Welfare Spending. A Disaggregated Analysis," *World Politics*, 55, 485–516.

Mohl, P. and O. Pamp (2008): "Income Inequality and Redistributive Spending: An Empirical Investigation of Competing Theories," *Luxembourg Income Study Working Paper*, No. 491.

Mortensen, D. T. (1978): "Specific Capital and Labor Turnover," *The Bell Journal of Economics*, 9, 572–586.

Neugart, M. (2008): "The Choice of Insurance in the Labor Market," *Public Choice*, 134, 445–462.

Nickell, S. (1997): "Unemployment and Labor Market Rigidities: Europe versus North America," *Journal of Economic Perspectives*, 11, 55–74.

Nickell, S., L. Nunziata, and W. Ochel (2005): "Unemployment in the OECD since the 1960s. What do we Know?" *Economic Journal*, 115, 1–27.

Nickell, W. (2006): "The CEP-OECD Institutions Data Set (1960-2004)," *CEP Discussion Paper*, No 759.

Niskanen, W. (1971): *Bureaucracy and Representative Government*, Chicago: Aldine Atherton.

Ockenfels, A., D. Sliwka, and P. Werner (2010): "Bonus Payments and Reference Point Violations," *IZA Discussion Paper No. 4795*, 31.

OECD (2007): *Benefits and Wages 2007. OECD Indicators*, Paris: OECD Publ.

——— (2008): *Growing Unequal? Income Distribution and Poverty in OECD Countries*, Paris: OECD Publ.

——— (2010a): "Annual Labour Force Statistics: Summary Tables," *OECD Employment and Labour Market Statistics (database)*, OECD.Stat (Accessed on 13/04/29).

——— (2010b): "Earnings: Gross Earnings Decile Ratios," *OECD Employment and Labour Market Statistics (database)*, OECD Stat. (Accessed on 20 June 2013).

——— (2010c): "Macro trade indicators," *OECD Statistics on Measuring Globalisation (database)*, OECD.Stat (Accessed on 12 June 2013).

——— (2010d): "Multi-factor Productivity," *OECD Productivity Statistics (database)*, OECD.Stat (Accessed on 30 April 2013).

——— (2011): *Divided We Stand: Why Inequality Keeps Rising*, Paris: OECD Publ.

——— (2012a): "Main Science and Technology Indicators," *OECD Science, Technology and R&D Statistics (database)*, OECD.Stat (Accessed on 30 April 2013).

——— (2012b): "Quarterly National Accounts," *OECD National Accounts Statistics (database)*, OECD.Stat (Accessed on 11 June 2013).

——— (2013a): "OECD Annual Projections," *Economic Outlook No. 93*, OECD.Stat (Accessed on 22 July 2013).

——— (2013b): "Trade in Value by Partner Countries," *Monthly Statistics of International Trade (database).*, OECD.Stat (Accessed on 11 June 2013).

——— (2013c): "Unit Labour Costs - Annual Indicators," *Main Econmic Indicators (database)*, OECD.Stat (Accessed on 29 April 2013).

Osterloh, M. and B. Frey (2000): "Motivation, Knowledge Transfer, and Organizational Forms," *Organization Science*, 11, 538–550.

Osterloh, M., J. Frost, and B. Frey (2002): "The Dynamics of Motivation in New Organizational Forms," *International Journal of the Economics of Business*, 9, 61–77.

Piketty, T. (1995): "Social Mobility and Redistributive Politics," *Quarterly Journal of Economics*, 3, 551–583.

Piper, G. and S. Schnepf (2008): "Gender Differences in Charitable Giving in Great Britain," *Voluntas*, 19, 103–124.

Pitlik, H. and S. Wirth (2003): "Do Crises Promote the Extent of Economic Liberalization?: An Empirical Test," *European Journal of Political Economy*, 19, 565–581.

Potrafke, N. (2013): "Globalization and Labor Market Institutions: International Empirical Evidence," *Journal of Comparative Economics*, forthcoming.

Prat, A. and D. Strömberg (2011): "The Political Economy of Mass Media," *CEPR Discussion Paper No. 8246*.

Ramsey, F. (1928): "A Mathematical Theory of Saving," *Economic Journal*, 38, 543–599.

Ranjan, P. (2012): "Trade Liberalization, Unemployment, and Inequality with Endogenous Job Destruction," *International Review of Economics and Finance*, 23, 16–29.

Rawls, J. (1971): *A Theory of Justice*, Cambridge: Belknap Press.

Razin, A. (2003): "FDI Flows and Domestic Investment: Overview," *CESifo Economic Studies*, 49, 415–428.

Reed-Arthurs, R. and S. Sheffrin (2010): "Understanding the Public's Attitudes towards Redistribution through Taxation," *Working Paper Tulane University, Department of Economics*, 1005.

Richardson, J. D. (1995): "Income Inequality and Trade: How to Think, What to Conclude," *Journal of Economic Perspectives*, 9, 33–55.

Roberts, M., P. Hite, and C. Bradley (1994): "Understanding Attitudes Toward Progressive Taxation," *Public Opinion Quarterly*, 58, 165–190.

Rodrik, D. (1997): *Has Globalization Gone Too Far?*, Washington D.C.: Peterson Institute for International Economics.

——— (1998): "Why Do More Open Economies Have Bigger Governments?" *Journal of Political Economy*, 106, 997–1032.

Ruffin, R. J. (1984): "International Factor Movements," in *Handbooks of International Economics*, ed. by R. W. Jones and P. B. Kenen, Amsterdam New York Oxford: Elsevier Science Publisher B.V., vol. I, 237–288.

Sachs, J. D. and H. J. Shatz (1994): "Trade and Jobs in U.S. Manufacturing," *Brookings Papers on Economic Activity*, 1, 1–84.

Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung (2013): *Gegen eine rückwärtsgewandte Wirtschaftspolitik. Jahresgutachten 2013/14*, Wiesbaden: Statistisches Bundesamt.

Saint-Paul, G. (2000): *The Political Economy of Labour Market Institutions*, Oxford: Oxford University Press.

Scheubel, B., D. Schunk, and J. Winter (2009): "Don't Raise the Retirement Age! An Experiment on Opposition to Pension Reforms and East-West Differences in Germany," *CESifo Working Paper No. 2752*.

Schlesinger, M. and C. Heldman (2001): "Gender Gap or Gender Gaps? New Perspectives on Support for Government Action and Policies," *Journal of Politics*, 63, 59–92.

Schneider, O. (2009): "Reforming Pensions in Europe: Economic Fundamentals and Political Factors," *CESifo Working Paper No. 2572*.

Schulze, G. G. and H. W. Ursprung (1999): "Globalisation of the Economy and the Nation State," *World Economy*, 22, 295–352.

Sheffrin, S. (1993): "What Does the Public Believe about Tax Fairness?" *National Tax Journal*, 46, 301–308.

——— (1994): "Perception of Fairness in the Crucible of Tax Policy," in *Tax Progressivity and Income Inequality*, ed. by J. Slemrod, Cambridge, 309–334.

Sinn, H.-W. (2003): *The New Systems Competition*, Malden (Mass.): Wiley-Blackwell.

Sinn, H.-W. and S. Übelmesser (2002): "Pensions and the path to Gerontocracy in Germany," *European Journal of Political Economy*, 19, 153–158.

Slaughter, M. (2001): "International Trade and Labor-Demand Elasticities," *Journal of International Economics*, 54, 27–56.

Slemrod, J. (2006): "The Role of Misperceptions in Support for Regressive Tax Reform," *National Tax Journal*, 59, 57–75.

Sondak, H. and T. Tyler (2007): "How Does Procedural Justice Shape the Desirability of Markets?" *Journal of Economic Psychology*, 28, 79–92.

Statistisches Reichsamt Germany (1926): *Statistical Yearbook of the German Reich 1924*, Berlin: Schmidt Berlin.

Stiehler, H.-J. (1998): "Das Tal der Ahnungslosen. Erforschung der TV-Rezeption zur Zeit der DDR." in *Medienrezeption seit 1945. Forschungsbefunde und Forschungsperspektiven.*, ed. by W. Klingler, G. Roters, and M. Gerhards, Baden-Baden, 187–202.

——— (2001): *Leben ohne Westfernsehen: Studien zur Medienwirkung und Mediennutzung in der Region Dresden in den 80er Jahren*, Leipzig.

Stolper, W. F. and P. A. Samuelson (1941): "Protection and Real Wages," *The Review of Economic Studies*, 9, 58–73.

Suhrcke, M. (2001): "Preferences for Inequality: East vs. West," *Innocenti Working Paper*, No. 89.

Tan, J. H. W. (2006): "Religion and Social Preferences: An Experimental Study," *Economic Letters*, 90, 60–67.

Terwey, M., A. Bens, H. Baumann, and S. Baltzer (2007): *Datenhandbuch ALLBUS 2006. ZA - Nr. 4500*, Köln und Mannheim: GESIS.

Tinbergen, J. (1974): "Substition of Graduate by Other Labor," *Kyklos*, 27, 217–226.

Trefler, D. (2004): "The Long and Short of the Canada-U.S. Free Trade Agreement," *American Economic Review*, 94, 870–895.

Tullock, G. (1965): *The Politics of Bureaucracy*, Washington D.C.

Van Reenen, J. (2011): "Wage Inequality, Technology and Trade: 21st Century Evidence," *CEP Occasional paper*, 28.

Vannoorenberghe, G. (2011): "Trade between Symmetric Countries, Heterogeneous Firms, and the Skill Premium," *Canadian Journal of Economics*, 44, 148–170.

Vannoorenberghe, G. and E. Janeba (2013): "Trade and the Political Economy of Redistribution," *CES ifo Working Papers*, 4062.

Varian, H. R. (1980): "Redistributive Taxation as Social Insurance," *Journal of Public Economics*, 14, 49–68.

Vaubel, R. (2000): "Internationaler Politischer Wettbewerb: Eine europäische Wettbewerbsaufsicht für Regierungen und die empirische Evidenz," in *Jahrbuch für Neue Politische Ökonomie*, Mohr Siebeck, vol. 19, 280–309.

——— (2005): "Sozialpolitische Konsequenzen der Globalisierung: Theorie und Empirie," in *Weltwirtschaftlicher Strukturwandel, nationale Wirtschaftspolitik und politische Rationalität: Festschrift für Juergen B. Donges zum 65. Geburtstag*, ed. by A. Freytag, Köln: Kölner Univ.-Verlag, 143–158.

——— (2010): "Freiheit in Deutschland: Wettbewerb der Staaten, Einfluss der Kirche, amerikanisches Erbe - Versuch einer historischen Erklärung," *Jahrbuch für die Ordnung von Wirtschaft und Gesellschaft (ORDO)*, 61, 53–74.

——— (2012): "Redistribution as Income Insurance," *Public Choice*, 152, 389–392.

Wagner, G. G., J. R. Frick, and J. Schupp (2007): "The German Socio-Economic Panel Study (SOEP) - Scope, Evolution and Enhancements," *SOEP Papers*, No. 1.

Wildasin, D. E. (1995): "Factor Mobility, Risk and Redistribution in the Welfare State," *Scandinavian Journal of Economics*, 97, 527–546.

Wilensky, H. (1976): *The 'New Corporatism'. Centralization and the Welfare State*, London.

Wilson, J. D. and D. E. Wildasin (2004): "Capital Tax Competition: bane or boon," *Journal of Public Economics*, 88, 1065–1091.

Wood, A. (1995): "How Trade Hurt Unskilled Workers," *Journal of Economic Perspectives*, 9, 57–80.

——— (1998): "Globalisation and the Rise in Labour Market Inequalities," *Economic Journal*, 108, 1463–1482.

World Bank (2012): "World Development Indicators," *(electronic database)*, (Accessed on 23 April 2013).

Yeaple, S. (2005): "A Simple Model of Firm Heterogeneity, International Trade, and Wages," *Journal of International Economics*, 65, 1–20.

Zellner, A. (1962): "An Efficient Method of Estimating Seemingly Unrelated Regressions and Tests for Aggregation bias," *Journal of the American Statistical Association*, 57, 348–368.

Zentralinstitut für Jugendforschung (1989): "Politisches Klima und gesellschaftliche Bedingungen in der DDR 1989 (ZA 6008)," Zentralarchiv für Empirische Sozialforschung (GESIS-ZA).

Zodrow, G. R. and P. Mieszkowski (1986): "Pigou, Tiebout, Property Taxation, and the Underprovision of Local Public Goods," *Journal of Urban Economics*, 19, 356–370.

Appendices

Appendix A

Globalization and income inequality

A.1 Data description and issues

Table A.1: Variable description

Variable	Definition	Source
Income distribution variables		
Market incomes	Gini coefficient of the distribution of market incomes.	Own calculations based on LIS data.
Disposable incomes	Gini coefficient of the distribution of disposable incomes.	
Redistribution	Percentage difference between the Gini coefficient of the market and disposable income distribution.	
Transmission variables		
Labor income share	Annual labor income share defined as total labor costs (i.e. compensation of employees adjusted for the self-employed) divided by nominal output.	OECD Main Economic Indicators
Wage dispersion	Decile ratio (i.e. the ratio between the 9^{th} and the 1^{st} decile) of gross wages of full-time employees.	OECD (2010b) Earnings database
Unemployment rate	Unemployment as a percentage of the civilian labor force.	OECD Labour Force Statistics
Relative supply of human capital	Number of individuals with tertiary education divided by those for whom primary education is the highest educational degree (both expressed as a percentage of the population older than 25 years).	Barro and Lee (2012)
Relative income of the unemployed	Average net income of unemployed individuals relative to the average net income of full-time employees. The analysis is limited to individuals aged 25 to 64 years.	Own calculations based on LIS data.
Globalization indicators		
Trade openness (log)	Trade in goods and services (i.e. sum of ex- and imports) as a percentage of GDP.	OECD (2010c): Macro Trade Indicators
Non-OECD imports (log)	Imports from non-OECD (excluding OPEC) countries as a share of total imports.	OECD (2013b): Monthly Statistics of International Trade
Net capital exports	Net exports of foreign direct, portfolio and other investments as a percentage of GDP.	Capital flows (IMF, 2012), GDP (World Bank, 2012)

Continued on next page

Table A.1 – continued from previous page

Variable	Definition	Source
Control variables		
Capital per worker (log)	Gross fixed capital formation divided by total employment.	Gross fixed capital formation (OECD, 2012b), total employment (OECD, 2010a)
Labor productivity	Labor productivity per unit labor input (i.e. real output divided by total labor input.	OECD (2013c): Unit Labour Costs
Multifactor productivity	Growth of multifactor productivity for the total economy (i.e. difference between the rate of change of output and rate of change of total input.	OECD (2010d): Productivity Database
Output gap	Deviation of actual GDP from potential GDP as a % of the potential GDP.	OECD (2013a): Economic Outlook
Labor market freedom	Labor market regulation index (subcomponent 5B of the Economic Freedom of the World index).	Gwartney et al. (2012)
Left government	Cabinet composition: social democratic and other left parties in percentage of total cabinet posts (weighted by days in office).	Armingeon et al. (2012)
Voter turnout	Voter turnout in parliamentary elections.	
GDP per capita	Real GDP divided by total population.	OECD (2012b)
Deviation real GDP growth	Deviation of the real GDP growth rate from its five-year average.	OECD (2012b)
Variables robustness test		
Gross capital movements (log)	Sum of in- and outflows of foreign direct, portfolio and other investments as a percentage of GDP.	Capital flows (IMF, 2012), GDP (World Bank, 2012)
Net FDI exports	Net exports of foreign direct investments as a percentage of GDP.	Capital flows (IMF, 2012), GDP (World Bank, 2012)
ICT investment (log)	Contribution of ICT equipment to growth of total capital services (in percent).	OECD (2010d): Productivity Database
R&D expenditures (log)	Gross domestic expenditure in research and experimental development as a percentage of GDP.	OECD (2012a): Main Science and
R&D personnel (log)	Total R&D personnel per 1,000 employees.	Technology Indicators

Continued on next page

Table A.1 – continued from previous page

Variable	Definition	Source
Employment protection	Indicator of the employment protection legislation (increasing in strictness of employment protection).	
Union density	Union density is equal to the ratio between union membership and employment (in percent).	
Union coverage	Number of workers covered by collective agreements as a percentage of total employment.	
Bargaining coordination	Index indicating the degree of bargaining coordination (increasing in the degree of coordination both on employers' and employees' side (interpolated).	Nickell (2006)
Gross replacement rates	OECD benefit replacement rates based on gross incomes and interpolated.	
Benefit duration	Index capturing the level of benefits in the later years of a spell relative to those available for the first year.	
Minimum wage	Minimum wage as a percentage of the median wage.	
Tax wedge	Sum of employment tax rate (i.e. employers' social security contributions), direct tax rate (income tax and employees' social security contributions) and indirect tax rates.	

Table A.2: Information about LIS data sets

Country	**Code**	**Wave**								
		Historical Databases	**I** *around 1980*	**II** *around 1985*	**III** *around 1990*	**IV** *around 1995*	**V** *around 2000*	**VI** *around 2004*	**VII** *around 2007*	**VIII** *around 2010*
Australia	AU		1981	1985	1989	1995	2001	2003		
Austria	AT					1997	2000	2004		
Belgium	BE			1985	1988	1995	2000			
					1992	1997				
Canada	CA	1971	1981	1987	1991	1994	1998	2004	2007	
		1975				1997	2000			
Czech Republic	CZ				1992	1996		2004		
Denmark	DK			1987	1992	1995	2000	2004		
Estonia	EE						2000	2004		
Finland	FI			1987	1991	1995	2000	2004		
France	FR			1984	1989	1994	2000	2005		
Germany	DE	1973		1983	1989	1994	2000	2004	2007	2010
		1978		1984						
Greece	GR					1995	2000	2004	2007	2010
Hungary	HU				1991	1994	1999	2005		
Ireland	IE			1987			2000	2004	2007	2010
Israel	IL		1979	1986	1992	1997	2001	2005	2007	
Italy	IT			1987	1989	1993	1998	2004	2008	2010
					1991	1995	2000			
Luxembourg	LU			1985	1991	1994	2000	2004	2007	2010
						1997				
Mexico	MX				1989	1994	1998	2004		
				1992	1996	2000				
						2002				
Netherlands	NL			1983	1990	1993	1999	2004		
				1987						

Continued on next page

Table A.2 – continued from previous page

Country	Code	Wave								
		Historical Databases	**I** *around 1980*	**II** *around 1985*	**III** *around 1990*	**IV** *around 1995*	**V** *around 2000*	**VI** *around 2004*	**VII** *around 2007*	**VIII** *around 2010*
Norway	NO		1979	1986	1991	1995	2000	2004		
Poland	PL				1992	1995	1999	2004		
Slovak Republic	SK			1992	1996			2004	2007	2010
Slovenia	SI					1997	1999	2004	2007	2010
Spain	ES				1990	1995	2000	2004	2007	2010
Sweden	SE	1967 1975	1981	1987	1992	1995	2000	2005		
Switzerland	CH		1982		1992		2000 2002	2004		
United Kingdom	UK	1969 1974	1979	1986	1991	1994 1995	1999	2004	2007	2010
United States	US	1969 1974	1979	1986	1991	1994 1997	2000	2004	2007	2010

Note: Reported are the years to which the collected income data refer.

Table A.3: Information on income concepts

Income source	**Income from**		**Definition**
Labor income	paid employment (both regular and causal)	basic wages and salaries, wage supplements, director wages	Cash wage and salary income (incl. social security contributions and income taxes) and goods and services received as a substitute for cash wages including monetary and non-monetary wage supplements.
	self-employment activity (farm and non-farm)	profit from businesses, and household production activities	Monetary and non-monetary profit/loss from self-employment activities (recorded gross of social security contributions but net of expenses). Includes value of home production for own consumption and barter gains (market value or government cost). Tax subsidies and/or national price subsidies are not included.
Capital income	provision of capital (incl. financial and non-financial assets).	interest and dividends, rental income, and royalties	Interest received from assets (incl. bank accounts, certificates of deposit, bonds), dividends, rentals from land, vehicles, equipment, dwellings, business buildings, and and receipts from boarders and lodgers. Included are also royalties, and capital income from investment in self-employment activity and voluntary individual pensions. Excluded are non-monetary income from capital (imputed value of the service of durable goods owned), capital gains and all kind of windfall incomes (e.g. lottery winnings, inheritances).
occupational pensions	Second pillar in a three-tiered pension system.		Usually systems provided by employers for retirement (either mandated by law or collective agreements and voluntary agreements between employers and employees) that supplement social security transfers. Self-employment pension plans (or personal pension plans) are included if designed to supplement social security.
= Market incomes			
Private transfers	transfers of a purely private nature	merit-based education transfers	Study grants and scholarships awarded for the merit (can include in-kind benefits).
		transfers from non-profit institutions	Regular cash and non-cash transfers from different types of charitable organizations as long as they are private.
		interhousehold transfers (alimony or child support, remittances, other family transfers)	Alimony and/or child support received from non-household members (can include in-kind benefits), regular monetary or non-monetary transfers from family members temporarily out of the household for working reasons, and other regular cash transfers from relatives.
Pension income	benefits from the first pillar in three-tiered pension schemes		
		mandatory individual pensions	Mandatory individual retirement pensions incl. those that have been opted out from the main national pension scheme to a private one.
		employment-related public pensions	Employment-related periodic payments from the public pension system. Eligibility

Continued on next page

Table A.3 – continued from previous page

Income source	Income from		Definition
		(old-age, disability, survivors insurance and work-injury public pensions)	is based on length of employment or self-employment and amounts are related to the level of earnings before retirement, and generally financed entirely or largely from contributions by employers and workers. Included are payments from public pension contributions by employers and workers. Included are payments from public pension system after retirement from gainful employment at the standard retirement age, in case of a (non-work-related) disability that impairing the ability to work or earn beyond a minimum level laid down by legislation, based on the relationship with a deceased person protected by the scheme (widows, widowers, orphans and similar), and in the event of permanent disability or death due to work-related sickness or injury.
		universal pensions (old-age, disability, survivors)	Non-employment related and non means-tested periodic payments from public institutions intended to maintain or support the income in case of old-age, disability or death of the breadwinner.
		assistance pensions (old-age, disability, survivors)	Non-contributory and means-tested public schemes providing a minimum entitlement in case of old-age, disability or death of the breadwinner.
(non-pension) social security transfers			
	work-related insurance transfers		
		short-term insurance (incl. sickness, maternity/parental, work-injury and unemployment wage replacement)	Wage replacement income for short-term interruptions. Eligibility is based on the existence and/or the length of an employment relationship and the amount depends usually on previous earnings and contributions. In most cases the benefits are financed by contributions paid by employers and/or workers.
		universal benefits (unemployment, disability, family/child, and education-related)	Monetary transfers from public programs that provide flat-rate benefits to certain residents or citizens, provided that they are in a certain situation, but without consideration of income, employment or assets. This includes non-employment related and non means-tested periodic payments in connection with first-time unemployment, disability, sickness or injury, cash payments for child or family allowances, and monetary education-related universal benefits.
		assistance benefits (general social assistance, unemployment, and family/maternity/child universal benefits, education, housing, heating, food, and medical assistance)	Monetary and non-monetary transfers especially targeted to needy individuals or households (i.e. with a strict income or assets test). The amount of the benefits is either flat rate or based on the difference between the recipient income and a the minimum subsistence needs as guaranteed by the government. Income support benefits are typically means-tested, i.e. paid to households or individuals whose resources fall below a prescribed level.
	income taxes and social security		Monetary expenditures (i.e. paid directly by the household and/or its members) and non-monetary expenditures (paid on behalf of the household and/or its members) on

Continued on next page

Table A.3 – continued from previous page

Income source	Income from	Definition
	contributions	income taxes and social security contributions (payroll taxes from workers for all forms of mandatory social insurance: social security, health plans, unemployment
= Disposable incomes		Total monetary and non-monetary current income net of income taxes and social security contributions.

Notes: More information on income definitions is provided in the LIS variable definition list available online at `http://www.lisdatacenter.org/our-data/lis-database/documentation/`.

Table A.4: Income inequality among prime age households (Gini coefficients, 1970 - 2010)

Country	Income concept	1970	1975	1980	1985	1990	1995	2000	2004	2007	2010
						around					
Country	Income concept										
Australia	Disposable			27.29	28.15	29.13	29.75	30.81	30.10		
	Market			35.89	38.15	38.57	42.31	43.69	41.98		
Austria	Disposable							25.23	26.38		
	Market							35.41	39.46		
Belgium	Disposable					21.40	23.89	26.55			
	Market					37.80	40.18	36.80			
Canada	Disposable	30.29	27.52	27.31	27.79	27.85	28.02/ 28.88	30.57/ 31.27	31.62	30.96	
	Market	36.27	34.24	33.68	35.41	37.56	38.26/ 38.28	40.65/ 39.92	40.30	39.70	
Czech Republic	Disposable					19.78	25.09		26.74		
	Market					32.42	35.46		39.74		
Denmark	Disposable				21.89	20.87	19.50	20.24	20.73		
	Market				32.16	35.15	35.50	34.60	35.29		
Finland	Disposable				18.90	18.93	20.44	23.81	24.10		
	Market				28.66	29.57	39.89	38.87	38.49		
Germany	Disposable	25.99	24.87		25.05/ 25.51	24.64	26.71	26.04	27.28	28.41	28.79
	Market	30.66	32.18		33.86/ 34.92	33.44	36.97	38.28	40.04	41.76	41.99
Greece	Disposable							32.14		31.39	32.61
	Market							38.30		39.87	41.87
Ireland	Disposable							30.04	30.86	29.05	28.91
	Market							38.35	45.07	45.81	51.91
Israel	Disposable			29.02		29.77	32.80	34.02	36.64	36.45	
	Market			38.71		42.96	45.70	49.37	48.18	47.60	
Italy	Disposable									31.86	33.13
	Market									37.32	39.29
Poland	Disposable							28.86	32.35		
	Market							43.48	48.25		
Luxembourg	Disposable								27.11	28.02	27.21
	Market								39.25	38.93	40.43
Netherlands	Disposable				24.49/ 22.14	25.14	24.70	22.32	25.91		
	Market				40.63/ 39.21	35.49	37.31	32.05	38.20		
Norway	Disposable			20.46	21.11	21.39	21.91	23.38	23.95		
	Market			29.19	27.57	31.01	32.60	33.83	36.57		
Spain	Disposable							33.22		30.05	33.03
	Market							39.25		37.14	42.04
Slovak Republic	Disposable					18.54			26.88	24.09	26.53
	Market					34.09			37.91	34.95	35.98

Continued on next page

Table A.4 – continued from previous page

Country	Income concept	1970	1975	1980	1985	1990	around 1995	2000	2004	2007	2010
Sweden	Disposable	23.90	18.84	18.48	18.46	20.08	19.54	23.54	22.16		
	Market	33.49	30.58	30.92	32.00	35.86	38.65	37.60	37.23		
Switzerland	Disposable			29.40		27.65		27.42/ 26.41	25.38		
	Market			32.69		31.59		31.26/ 31.14	30.42		
United Kingdom	Disposable	26.12	25.32	24.95	29.39	32.27	34.01/ 33.35	33.87	33.84	34.82	35.23
	Market	32.40	31.46	33.63	42.27	42.34	46.10/ 45.31	45.02	44.72	44.73	46.23
United States	Disposable		29.95	28.61	32.11	32.47	34.52/ 36.59	35.96	36.29	36.83	36.52
	Market	35.46	36.57	36.78	40.23	40.68	43.21/ 44.51	44.00	44.88	44.59	46.11

Notes: Excluded from the calculation are households with a reported disposable income below or equal to zero.
Source: Own calculations based on the Luxembourg Income Study (LIS) Database, `http://www.lisdatacenter.org` (multiple countries, May 2013). Luxembourg: LIS.

A.1.1 Measurement error

Researchers who conduct empirical studies of the income distribution and the comparison of distributions or trends in inequality across countries usually have to address several data quality issues. Since the available data on income distributions deviates from the ideal measure of economic well-being, it is important to identify the relevant sources of measurement error.

To illustrate what kind of measurement error will bias across country comparisons of inequality levels and trends, I make use of an simple error component model proposed by Atkinson et al. (2000); Gottschalk and Smeeding (2000).

Cross-country comparison of inequality levels
The measure of the j^{th} percentile in country c is equal to:

$$\begin{aligned} lnP_c^j &= ln\pi_c^j + m_c^j \\ m_c^j &= d_c + v^j + e_c^j, \end{aligned}$$

where P_c^j is the measured percentile j in country c, π_c^j stands for the true percentile using the ideal concept of economic well-being and m_c^j is the measurement error component. The measurement error can be decomposed into three different sources of error: d_c is a country specific component that affects all deciles in a country similarly, v^j is a decile-specific component which is common to all countries, and e_c^j is both decile- and country-specific.

Calculation the ratio of the 90^{th} and 10^{th} percentile in a single country c, the measured inequality level can be expressed as follows:

$$ln(P_c^{90}/P_c^{10}) = ln(\pi_c^{90}/\pi_c^{10}) + (v^{90} - v^{10}) + (e_c^{90} - e_c^{10}).$$

The measurement error does only consist of decile-specific components, while d_c^{90}/d_c^{10} cancels out. Consequently, measurement error that affects all deciles in a country equally (e.g. consumption of public goods unrelated to the decile rank) will not bias the 90/10 ratio.

Now, I focus on cross-national studies by comparing the 90/10 ratio in country L and K:

$$ln(P_L^{90}/P_L^{10}) - ln(P_K^{90}/P_K^{10}) = ln(\pi_L^{90}/\pi_L^{10}) - ln(\pi_K^{90}/\pi_K^{10}) + (e_L^{90} - e_L^{10}) - (e_K^{90} - e_K^{10}).$$

For cross-national comparisons of inequality at a point in time only errors that differ

both across deciles and across countries matter and should be addressed appropriately.[240]

Cross-country comparison of trends in inequality

To start with within-country trends, suppose that the measured percentile j in year t is equal to:

$$\begin{aligned} lnP_t^j &= ln\pi_t^j + m_t^j \\ m_t^j &= n_t + v^j + r_t^j, \end{aligned}$$

where n_t is a time-specific component that affects all deciles and r_t^j is both decile- and time-specific.

The measured 90/10 ratio is then as follows:

$$ln(P_t^{90}/P_t^{10}) = ln(\pi_t^{90}/\pi_t^{10}) + (v^{90} - v^{10}) + (r_t^{90} - r_t^{10}).$$

Over time, the 90/10 ratio in a given country is only affect by measurement error that is both decile- and time-specific.

$$\begin{aligned} ln(P_t^{90}/P_t^{10}) - ln(P_{t+1}^{90}/P_{t+1}^{10}) = ln(\pi_t^{90}/\pi_t^{10}) - ln(\pi_{t+1}^{90}/\pi_{t+1}^{10}) \\ + (r_t^{90} - r_t^{10}) - (r_{t+1}^{90} - r_{t+1}^{10}) \end{aligned}$$

After focusing on the relevant sources of measurement error for cross-country comparisons in level of inequality and within-country trends in inequality, the following combines both in the comparison of inequality trends across countries.

$$\begin{aligned} lnP_{ct}^j &= ln\pi_{ct}^j + m_{ct}^j \\ m_{ct}^j &= d_c + v^j + e_c^j + h_{ct}^j \\ h_{ct}^j &= g_{ct} + r_t^j + f_{ct}^j, \end{aligned}$$

where g_{ct} is a time-specific component that affects all deciles equally in country c and f_{ct}^j is a time-, country- and decile-specific component.

The comparison of trends in the 90/10 ratio between two countries L and K

[240] The irrelevance of certain error components does not imply that measurement error is not an important issue in cross-country analysis of inequality. Although the measurement error (noise) gets smaller, the same applies for the ideal measure (signal). By comparing the inequality across countries (and/or time) the signal-to-noise ratio might even decrease (e.g. Gottschalk and Smeeding, 2000).

looks as follows:

$$\begin{aligned}(ln(P^{90}_{Lt} - P^{10}_{Lt}) - ln(P^{90}_{L,t+1} - P^{10}_{L,t+1})) - (ln(P^{90}_{Kt} - P^{10}_{Kt}) - ln(P^{90}_{K,t+1} - P^{10}_{K,t+1})) = \\ (ln(\pi^{90}_{Lt} - \pi^{10}_{Lt}) - ln(\pi^{90}_{L,t+1} - \pi^{10}_{L,t+1})) - (ln(\pi^{90}_{Kt} - \pi^{10}_{Kt}) - ln(\pi^{90}_{K,t+1} - \pi^{10}_{K,t+1})) \\ +((h^{90}_{Lt} - h^{10}_{Lt}) - (h^{90}_{L,t+1} - h^{10}_{L,t+1})) - ((h^{90}_{Kt} - h^{10}_{Kt}) - (h^{90}_{K,t+1} - h^{10}_{K,t+1}))\end{aligned}$$

The remaining measurement error h^j_{ct} in cross-country comparison of trends can be further decomposed. Since the error component g_{ct} is common to all deciles in a country in a given year, it will not bias an analysis of the 90/10 ratio. Furthermore, the component r^j_t that is time- and decile-specific but common across countries drops out. The relevant error that will blur a comparison of trends in inequality across countries is therefore time-, country- and decile-specific (f^j_{ct}).

I have, thus, for the cross-country comparison of trends put a special emphasize on changes in the LIS data over time within countries affecting different parts of the income distribution differently.

A.2 Robustness checks

Table A.5: Labor income share: labor market institutions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Trade openness$_{(t-1)}$ (log)	-0.0898***	-0.0122	-0.0797***	-0.0135	-0.1044***	0.0059	-0.1084***	-0.0269	-0.0865***	-0.0301	-0.0745***	-0.0192	-0.1251***	0.1769***	-0.0749***	0.0412
	(0.0088)	(0.0246)	(0.0100)	(0.0249)	(0.0109)	(0.0279)	(0.0109)	(0.0295)	(0.0073)	(0.0260)	(0.0085)	(0.0253)	(0.0173)	(0.0362)	(0.0077)	(0.0280)
Non-OECD imports$_{(t-1)}$ (log)	0.0017	0.0102	0.0021	0.0080	0.0118	0.0216*	0.0126	0.0159	0.0103	0.0156	-0.0082	-0.0009	0.0803***	0.1172***	0.0101	0.0224**
	(0.0100)	(0.0108)	(0.0096)	(0.0105)	(0.0117)	(0.0110)	(0.0120)	(0.0111)	(0.0103)	(0.0098)	(0.0100)	(0.0110)	(0.0230)	(0.0188)	(0.0112)	(0.0110)
Net capital exports$_{(t-1)}$	-0.0028***	-0.0027***	-0.0029***	-0.0026***	-0.0028***	-0.0028***	-0.0027***	-0.0028***	-0.0029***	-0.0028***	-0.0028***	-0.0028***	-0.0026***	-0.0010	-0.0030***	-0.0028***
	(0.0005)	(0.0005)	(0.0005)	(0.0005)	(0.0007)	(0.0006)	(0.0006)	(0.0006)	(0.0006)	(0.0006)	(0.0006)	(0.0006)	(0.0009)	(0.0009)	(0.0006)	(0.0006)
Labor productivity$_{(t-1)}$	0.0017*	0.0024***	0.0016*	0.0023**	0.0007	0.0009	0.0013	0.0020**	0.0008	0.0014	0.0014	0.0022**	0.0019*	-0.0007	0.0011	0.0012
	(0.0009)	(0.0009)	(0.0009)	(0.0009)	(0.0010)	(0.0010)	(0.0009)	(0.0010)	(0.0008)	(0.0009)	(0.0009)	(0.0010)	(0.0011)	(0.0011)	(0.0010)	(0.0011)
Capital per worker$_{(t-1)}$ (log)	0.0360***	0.0399***	0.0355***	0.0404***	0.0358***	0.0403***	0.0526***	0.0619***	0.0258**	0.0289***	0.0319***	0.0344***	0.0531**	0.0371	0.0186	0.0082
	(0.0114)	(0.0117)	(0.0115)	(0.0119)	(0.0125)	(0.0114)	(0.0142)	(0.0130)	(0.0105)	(0.0101)	(0.0113)	(0.0117)	(0.0223)	(0.0247)	(0.0115)	(0.0118)
Employment protection$_{(t-1)}$	-0.0001	-0.0191														
	(0.0180)	(0.0178)														
Union density$_{(t-1)}$			0.0006*	-0.0000												
			(0.0003)	(0.0003)												
Union coverage$_{(t-1)}$					-0.0009***	-0.0012***										
					(0.0003)	(0.0003)										
Bargaining coordination$_{(t-1)}$							-0.0084***	-0.0111***								
							(0.0029)	(0.0028)								
Gross replacement rates$_{(t-1)}$									-0.0025***	-0.0022***						
									(0.0003)	(0.0003)						
Benefit duration$_{(t-1)}$											-0.0773***	-0.0514***				
											(0.0177)	(0.0198)				
Minimum relative to median wage$_{(t-1)}$													-0.0008	-0.0022***		
													(0.0006)	(0.0005)		
Tax wedge$_{(t-1)}$															-0.0020***	-0.0020***
															(0.0005)	(0.0005)
Year fixed effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R-Square	0.8767	0.8911	0.8762	0.8886	0.8701	0.8944	0.8708	0.8909	0.8990	0.9098	0.8845	0.8939	0.9287	0.9671	0.7635	0.7982
Observations	329	329	328	328	270	270	279	279	329	329	329	329	136	136	281	281

Notes: Fixed effects estimations. Robust standard errors are reported in parentheses. ***/**/* denotes significance at the 1/5/10%-level.

Table A.6: Wage dispersion: labor market institutions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Trade openness$_{(t-1)}$ (log)	0.4752***	-0.0783	0.4064***	0.2681	0.4719***	0.4658**	0.4289***	0.2689	0.4895***	0.2311	0.5548***	0.0818	0.1790**	0.8144**	0.6828***	0.9883***
	(0.0788)	(0.2109)	(0.0865)	(0.1872)	(0.0844)	(0.2272)	(0.0931)	(0.2421)	(0.0736)	(0.1689)	(0.0800)	(0.1907)	(0.0844)	(0.3242)	(0.1044)	(0.2959)
Non-OECD imports$_{(t-1)}$ (log)	0.0677	0.1913*	0.0342	0.1268	0.0625	0.2664***	0.0133	0.1419	0.0887	0.2067**	0.0087	0.0487	0.2109*	0.8159***	-0.1348	0.0441
	(0.0753)	(0.1088)	(0.0809)	(0.1118)	(0.0980)	(0.0970)	(0.0913)	(0.1108)	(0.0723)	(0.1023)	(0.0766)	(0.1212)	(0.1155)	(0.1339)	(0.1351)	(0.1628)
Net capital exports$_{(t-1)}$	-0.0202***	-0.0085**	-0.0189***	-0.0108***	-0.0190***	-0.0006	-0.0203***	-0.0073	-0.0199***	-0.0101**	-0.0202***	-0.0113***	-0.0257***	-0.0070	-0.0147***	-0.0005
	(0.0041)	(0.0040)	(0.0042)	(0.0040)	(0.0038)	(0.0037)	(0.0043)	(0.0045)	(0.0041)	(0.0040)	(0.0042)	(0.0043)	(0.0067)	(0.0075)	(0.0053)	(0.0048)
Labor productivity$_{(t-1)}$	0.0139**	0.0261***	0.0131*	0.0228***	0.0070	0.0096*	0.0096	0.0165**	0.0084	0.0148**	0.0110	0.0206***	0.0011	-0.0019	0.0111	0.0084
	(0.0070)	(0.0070)	(0.0067)	(0.0070)	(0.0063)	(0.0057)	(0.0069)	(0.0071)	(0.0067)	(0.0065)	(0.0068)	(0.0068)	(0.0092)	(0.0087)	(0.0080)	(0.0079)
Capital per worker$_{(t-1)}$ (log)	0.1529	0.5923***	0.1970**	0.4898***	0.1867*	0.5584***	0.3648***	0.7216***	0.1420	0.4615***	0.1247	0.4488***	0.1972	0.8378***	0.1286	0.2638**
	(0.0973)	(0.1101)	(0.0957)	(0.1100)	(0.0952)	(0.1006)	(0.1257)	(0.1333)	(0.0963)	(0.1054)	(0.0969)	(0.1102)	(0.1613)	(0.2003)	(0.1168)	(0.1287)
Employment protection$_{(t-1)}$	-0.1974	-0.5444***														
	(0.1444)	(0.1686)														
Union density$_{(t-1)}$			-0.0042	-0.0025												
			(0.0028)	(0.0033)												
Union coverage$_{(t-1)}$					-0.0052***	-0.0071***										
					(0.0019)	(0.0016)										
Bargaining coordination$_{(t-1)}$							-0.0631**	-0.0655**								
							(0.0296)	(0.0312)								
Gross replacement rates$_{(t-1)}$									-0.0136***	-0.0155***						
									(0.0032)	(0.0039)						
Benefit duration$_{(t-1)}$											-0.3188*	-0.4253**				
											(0.1621)	(0.2039)				
Minimum relative to median wage$_{(t-1)}$													-0.0354***	-0.0210***		
													(0.0044)	(0.0052)		
Tax wedge$_{(t-1)}$															-0.0225***	-0.0334***
															(0.0061)	(0.0073)
Year fixed effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R-Square	0.9480	0.9550	0.9487	0.9525	0.9562	0.9712	0.9495	0.9547	0.9533	0.9603	0.9487	0.9539	0.9713	0.9819	0.9522	0.9641
Observations	217	217	217	217	169	169	175	175	217	217	217	217	100	100	176	176

Notes: Fixed effects estimations. Robust standard errors are reported in parentheses. ***/**/* denotes significance at the 1/5/10%-level.

Table A.7: Unemployment rate: labor market institutions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Trade openness$_{(t-1)}$	-0.4705	-0.5482	-0.1987	-0.8121	-0.6684	-1.8676	-1.0064	-1.6768	-1.0877	-0.1276	-0.4530	-0.7184	1.0170	-6.1021*	-2.0150**	-3.6154**
(log)	(0.7059)	(1.4369)	(0.6714)	(1.4437)	(0.7634)	(1.6845)	(0.7730)	(1.7924)	(0.6689)	(1.3599)	(0.7043)	(1.4380)	(0.9870)	(3.6416)	(0.8320)	(1.7569)
Non-OECD	-1.6779**	-3.8753***	-1.3178**	-3.6837***	-0.4466	-2.8119***	-0.6612	-2.8908***	-1.7436***	-3.5173***	-1.6869**	-3.9449***	-3.8730***	-4.3505***	-0.4419	-3.2824***
imports$_{(t-1)}$ (log)	(0.6676)	(0.7388)	(0.6323)	(0.7504)	(0.6592)	(0.8112)	(0.6304)	(0.8374)	(0.5913)	(0.6898)	(0.6685)	(0.7642)	(1.1139)	(1.2157)	(0.6501)	(0.7611)
Net capital	0.0038	0.0181	-0.0099	0.0106	-0.0159	0.0300	-0.0055	0.0274	0.0142	0.0302	0.0023	0.0162	0.0112	-0.0184	-0.0245	-0.0040
exports$_{(t-1)}$	(0.0254)	(0.0251)	(0.0253)	(0.0249)	(0.0344)	(0.0344)	(0.0291)	(0.0305)	(0.0230)	(0.0253)	(0.0256)	(0.0253)	(0.0486)	(0.0484)	(0.0318)	(0.0305)
Output gap$_{(t-1)}$	-0.4220***	-0.6372***	-0.4183***	-0.6230***	-0.3896***	-0.6254***	-0.4021***	-0.6084***	-0.4812***	-0.6615***	-0.4169***	-0.6280***	-0.3087***	-0.3819***	-0.5022***	-0.7507***
	(0.0622)	(0.0735)	(0.0597)	(0.0736)	(0.0675)	(0.0855)	(0.0613)	(0.0845)	(0.0555)	(0.0695)	(0.0647)	(0.0774)	(0.0727)	(0.1274)	(0.0692)	(0.0766)
Labor	-0.0532	-0.0128	-0.0362	0.0051	-0.0714	-0.0212	-0.0637	-0.0348	-0.0352	-0.0049	-0.0480	-0.0075	-0.0025	0.0164	-0.0640	0.0144
productivity$_{(t-1)}$	(0.0554)	(0.0591)	(0.0576)	(0.0595)	(0.0530)	(0.0629)	(0.0532)	(0.0581)	(0.0549)	(0.0575)	(0.0544)	(0.0575)	(0.0645)	(0.0693)	(0.0732)	(0.0956)
Capital per	-4.4874***	-0.3257	-4.1032***	-0.2550	-5.4688***	-0.6285	-5.2687***	-0.7705	-3.0281**	0.8936	-4.4375***	-0.3434	-6.4623***	-5.5404**	-2.2197	1.8492
worker$_{(t-1)}$ (log)	(1.4192)	(1.5860)	(1.3398)	(1.5168)	(1.5074)	(1.7390)	(1.4487)	(1.8039)	(1.3386)	(1.5558)	(1.4288)	(1.5629)	(1.3724)	(2.2278)	(1.7670)	(1.7434)
Employment	0.7468	0.5633														
protection$_{(t-1)}$	(0.9120)	(0.9240)														
Union			0.0447**	0.0183												
density$_{(t-1)}$			(0.0207)	(0.0196)												
Union					0.0518***	0.0387**										
coverage$_{(t-1)}$					(0.0181)	(0.0150)										
Bargaining							0.4702*	-0.0575								
coordination$_{(t-1)}$							(0.2491)	(0.2594)								
Gross replacement									0.0758***	0.0535**						
rates$_{(t-1)}$									(0.0238)	(0.0206)						
Benefit											-0.9732	-0.9873				
duration$_{(t-1)}$											(0.9304)	(0.9134)				
Minimum relative to													0.0673	0.1037*		
median wage$_{(t-1)}$													(0.0607)	(0.0608)		
Tax wedge$_{(t-1)}$															0.0922**	0.0812**
															(0.0367)	(0.0318)
Year fixed effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R-Square	0.8744	0.8983	0.8774	0.8983	0.8963	0.9132	0.8918	0.9079	0.8829	0.9020	0.8746	0.8987	0.8655	0.8782	0.8845	0.9103
Observations	240	240	239	239	186	186	190	190	240	240	240	240	98	98	192	192

Notes: Fixed effects estimations. Robust standard errors are reported in parentheses. ***/**/* denotes significance at the 1/5/10%-level.

Table A.8: Relative human capital supply: labor market institutions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Trade openness$_{(t-5)}$	7.7807***	10.0350***	7.2441***	9.8840***	8.0278***	17.0813***	7.3637***	16.3114***	7.6395***	9.9071***	8.1589***	8.7959***	10.6316***	16.6036***	11.1549***	22.9613***
(log)	(1.6517)	(2.9974)	(1.5673)	(2.9784)	(1.6672)	(4.0126)	(1.5708)	(3.9894)	(1.5857)	(3.0985)	(1.5682)	(3.1198)	(2.4008)	(5.6056)	(2.1477)	(4.9402)
Non-OECD	-0.8944	-0.1787	0.3667	0.1427	-0.5822	0.8465	-0.0778	2.4508*	-0.8320	-0.3315	-1.1579	-1.3093	-1.5425	0.9093	-3.4554**	-2.5681*
imports$_{(t-5)}$ (log)	(0.8907)	(1.0870)	(0.9126)	(1.0307)	(0.8936)	(1.0150)	(0.8539)	(1.3108)	(0.8806)	(1.1165)	(0.8698)	(1.2089)	(1.4940)	(2.0754)	(1.3551)	(1.4511)
Net capital	-0.1063**	-0.0969**	-0.1194**	-0.0980**	-0.1685***	-0.1324**	-0.1157**	-0.0785	-0.1117**	-0.0996**	-0.1134**	-0.1089***	-0.2329***	-0.1745*	-0.1624***	-0.1895***
exports$_{(t-5)}$	(0.0444)	(0.0407)	(0.0476)	(0.0406)	(0.0564)	(0.0512)	(0.0506)	(0.0491)	(0.0456)	(0.0413)	(0.0441)	(0.0405)	(0.0867)	(0.0952)	(0.0548)	(0.0557)
Capital per	-1.4027	1.4301	-0.7185	1.7595	-2.4537*	1.4151	-2.0843	2.7072*	-1.4514	1.2251	-0.9416	0.7978	-3.6535	0.7270	-3.3500**	-0.5092
worker$_{(t-5)}$ (log)	(1.2058)	(1.4046)	(1.2065)	(1.4360)	(1.3979)	(1.5495)	(1.4106)	(1.5579)	(1.2165)	(1.5544)	(1.1465)	(1.3603)	(2.4379)	(3.2531)	(1.6523)	(1.8693)
Multifactor	0.0918	0.2136**	0.0992	0.2032**	-0.0062	-0.0208	0.0157	0.0313	0.1094	0.2098**	0.0849	0.1910*	0.0119	0.0103	0.1218	0.0840
productivity$_{(t-5)}$	(0.0846)	(0.1071)	(0.0804)	(0.0995)	(0.0928)	(0.1162)	(0.0889)	(0.1057)	(0.0821)	(0.1044)	(0.0797)	(0.1011)	(0.1440)	(0.2001)	(0.0999)	(0.1496)
Employment	1.4658	-0.1035														
protection$_{(t-5)}$	(0.9102)	(0.8851)														
Union			0.0281	0.0144												
density$_{(t-5)}$			(0.0210)	(0.0233)												
Union					0.0071	-0.0020										
coverage$_{(t-5)}$					(0.0160)	(0.0180)										
Bargaining							0.3094	0.8562***								
coordination$_{(t-5)}$							(0.2256)	(0.3191)								
Gross replacement									-0.0361*	-0.0095						
rates$_{(t-5)}$									(0.0210)	(0.0244)						
Benefit											-3.5910***	-2.9924***				
duration$_{(t-5)}$											(0.7764)	(1.0305)				
Minimum relative to													-0.1582**	-0.1520*		
median wage$_{(t-5)}$													(0.0755)	(0.0881)		
Tax wedge$_{(t-5)}$															-0.1561***	-0.1411***
															(0.0430)	(0.0456)
Year fixed effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R-Square	0.9049	0.9018	0.9078	0.9067	0.9071	0.9100	0.9040	0.9106	0.9050	0.9019	0.9082	0.9043	0.9135	0.9007	0.9171	0.9212
Observations	201	201	202	202	153	153	157	157	201	201	201	201	94	94	153	153

Notes: Fixed effects estimations. Robust standard errors are reported in parentheses. ***/**/* denotes significance at the 1/5/10%-level.

Table A.9: Relative income unemployed: labor market institutions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Trade openness$_{(t-1)}$ (log)	-0.2677***	0.1885***	-0.1298***	0.0291	-0.1785***	0.1472	-0.1792***	0.2227***	-0.1943***	0.2385***	-0.0593	0.8173***	-0.2248***	0.2109**
	(0.0515)	(0.0685)	(0.0311)	(0.0947)	(0.0344)	(0.1067)	(0.0366)	(0.0807)	(0.0435)	(0.0739)	(0.0406)	(0.2107)	(0.0450)	(0.0923)
Non-OECD imports$_{(t-1)}$ (log)	0.1607**	0.1233**	0.2271***	0.1554***	0.1291*	0.0727	0.1300*	0.0732	0.1059	0.0442	-0.0669	0.1896**	0.2469***	0.1004
	(0.0749)	(0.0592)	(0.0741)	(0.0500)	(0.0687)	(0.0530)	(0.0691)	(0.0505)	(0.0736)	(0.0541)	(0.0547)	(0.0950)	(0.0928)	(0.0643)
Net capital exports$_{(t-1)}$	-0.0042**	-0.0056***	-0.0078***	-0.0078***	-0.0054**	-0.0063**	-0.0023	-0.0035*	-0.0031*	-0.0056***	-0.0106***	-0.0183***	-0.0051**	-0.0090***
	(0.0017)	(0.0020)	(0.0016)	(0.0018)	(0.0023)	(0.0025)	(0.0017)	(0.0020)	(0.0016)	(0.0019)	(0.0037)	(0.0042)	(0.0022)	(0.0024)
Left government$_{(t-1)}$	0.0002	0.0002	0.0002	0.0002	0.0006***	0.0005***	0.0004*	0.0004**	0.0004*	0.0003**	0.0006***	0.0009***	0.0002	0.0002
	(0.0002)	(0.0001)	(0.0002)	(0.0001)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0001)	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Voter turnout$_{(t-1)}$	0.0009	-0.0013	0.0014	0.0009	-0.0001	-0.0016	0.0011	-0.0010	0.0011	-0.0009	0.0011	-0.0016	0.0002	-0.0019
	(0.0014)	(0.0016)	(0.0011)	(0.0014)	(0.0015)	(0.0017)	(0.0015)	(0.0017)	(0.0014)	(0.0015)	(0.0015)	(0.0021)	(0.0014)	(0.0016)
Employment protection$_{(t-1)}$	-0.3127***	-0.2596***												
	(0.0757)	(0.0673)												
Union density$_{(t-1)}$			0.0095***	0.0076***										
			(0.0015)	(0.0015)										
Union coverage$_{(t-1)}$					0.0056***	0.0025***								
					(0.0011)	(0.0010)								
Bargaining coordination$_{(t-1)}$							0.0418**	0.0253*						
							(0.0179)	(0.0146)						
Benefit duration$_{(t-1)}$									-0.0035	-0.0021				
									(0.0631)	(0.0634)				
Minimum relative to median wage$_{(t-1)}$											0.0078**	0.0006		
											(0.0034)	(0.0047)		
Tax wedge$_{(t-1)}$													0.0029	0.0007
													(0.0020)	(0.0019)
Year fixed effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R-Square	0.6090	0.7014	0.6579	0.7141	0.6554	0.7028	0.6164	0.6977	0.5731	0.6787	0.5964	0.6057	0.5754	0.6799
Observations	257	257	257	257	213	213	222	222	257	257	110	110	221	221

Notes: Fixed effects estimations. Robust standard errors are reported in parentheses. ***/**/* denotes significance at the 1/5/10%-level.

Table A.10: Labor income share: different time lags

	t - 1		t		t - 5		t - 10		Δ		Δ t - 1	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Trade openness$_{(t-1)}$ (log)	-0.0805***	-0.0330**										
	(0.0074)	(0.0151)										
Trade openness (log)			-0.0825***	-0.0232								
			(0.0074)	(0.0152)								
Trade openness$_{(t-5)}$ (log)					-0.0685***	0.013						
					(0.0074)	(0.0175)						
Trade openness$_{(t-10)}$ (log)							-0.0477***	0.0603**				
							(0.0078)	(0.0241)				
Δ Trade openness (log)									-0.0848***	-0.0429		
									(0.0182)	(0.0286)		
Δ Trade openness$_{(t-1)}$ (log)											0.0052	-0.024
											(0.0146)	(0.0219)
Non-OECD imports$_{(t-1)}$ (log)	-0.0242***	-0.0011										
	(0.0078)	(0.0095)										
Non-OECD imports (log)			-0.0206**	0.01								
			(0.0080)	(0.0099)								
Non-OECD imports$_{(t-5)}$ (log)					-0.0250**	-0.0122						
					(0.0108)	(0.0096)						
Non-OECD imports$_{(t-10)}$ (log)							-0.0189	-0.0068				
							(0.0122)	(0.0111)				
Δ Non-OECD imports (log)									-0.0065	0.0014		
									(0.0088)	(0.0084)		
Δ Non-OECD imports$_{(t-1)}$ (log)											-0.0168*	-0.0187**
											(0.0090)	(0.0089)
Net capital exports$_{(t-1)}$	-0.0019***	-0.0016***										
	(0.0003)	(0.0003)										
Net capital exports			-0.0017***	-0.0015***								
			(0.0003)	(0.0003)								
Net capital exports$_{(t-5)}$					-0.0006*	-0.0004						
					(0.0004)	(0.0003)						
Net capital exports$_{(t-10)}$							-0.0003	-0.0001				
							(0.0005)	(0.0004)				
Δ Net capital exports									-0.0002	-0.0002		
									(0.0002)	(0.0002)		
Δ Net capital exports$_{(t-1)}$											-0.0002	-0.0002
											(0.0002)	(0.0002)
Labor productivity	0.0009	0.0013*	0.0011	0.0012	0.0024***	0.0014*	0.0003	-0.0014*	-0.0013***	-0.0012***	-0.0009***	-0.0005*
	(0.0007)	(0.0008)	(0.0008)	(0.0008)	(0.0008)	(0.0008)	(0.0008)	(0.0008)	(0.0003)	(0.0003)	(0.0003)	(0.0003)
Capital per worker (log)	0.0282***	0.0303***	0.0013	0.0067	0.0244***	0.0199**	0.0101	-0.0155	-0.0123	-0.0016	0.0399***	0.0390***
	(0.0079)	(0.0077)	(0.0083)	(0.0099)	(0.0086)	(0.0086)	(0.0107)	(0.0106)	(0.0195)	(0.0242)	(0.0094)	(0.0091)
Labor market freedom	0.0086***	0.0137***	0.0093***	0.0147***	0.0116***	0.0093***	0.0065**	0.0068**	0.0019	0.0029	0.0019	0.0023
	(0.0020)	(0.0027)	(0.0021)	(0.0028)	(0.0021)	(0.0024)	(0.0032)	(0.0027)	(0.0019)	(0.0026)	(0.0015)	(0.0020)
Year fixed effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No
Adj. R-Square	0.893	0.903	0.89	0.9011	0.8927	0.8999	0.8785	0.9019	0.1505	0.1928	0.0832	0.2228
Observations	485	485	488	488	413	413	304	304	465	465	462	462

Notes: Fixed effects estimations. Robust standard errors are reported in parentheses. The column titles indicate the time lag at which the further explanatory variables are included in the respective specifications. ***/**/* denotes significance at the 1/5/10%-level.

Table A.11: Wage dispersion: different time lags

	t - 1		t		t - 5		t - 10		Δ		Δ t - 1	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Trade openness$_{(t-1)}$ (log)	0.3794***	0.3008**										
	(0.0721)	(0.1184)										
Trade openness (log)			0.3348***	0.3311***								
			(0.0762)	(0.1187)								
Trade openness$_{(t-5)}$ (log)					0.5592***	0.2703*						
					(0.0789)	(0.1583)						
Trade openness$_{(t-10)}$ (log)							0.4508***	0.1365				
							(0.0742)	(0.1814)				
Δ Trade openness (log)									0.176	0.3266		
									(0.1568)	(0.2477)		
Δ Trade openness$_{(t-1)}$ (log)											-0.0293	-0.0827
											(0.1974)	(0.2954)
Non-OECD imports$_{(t-1)}$ (log)	0.0507	0.3027**										
	(0.0727)	(0.1364)										
Non-OECD imports (log)			0.0164	0.2784**								
			(0.0757)	(0.1272)								
Non-OECD imports$_{(t-5)}$ (log)					-0.0174	0.1951*						
					(0.0771)	(0.0998)						
Non-OECD imports$_{(t-10)}$ (log)							0.0283	0.1177				
							(0.0715)	(0.0823)				
Δ Non-OECD imports (log)									-0.0198	0.0386		
									(0.0805)	(0.1011)		
Δ Non-OECD imports$_{(t-1)}$ (log)											-0.0127	-0.0542
											(0.1087)	(0.1209)
Net capital exports$_{(t-1)}$	0.0013	0.001										
	(0.0026)	(0.0024)										
Net capital exports			0.0024	0.0026								
			(0.0022)	(0.0023)								
Net capital exports$_{(t-5)}$					-0.0051	-0.0035						
					(0.0033)	(0.0033)						
Net capital exports$_{(t-10)}$							-0.0032	-0.004				
							(0.0037)	(0.0031)				
Δ Net capital exports									0.0016	0.0003		
									(0.0027)	(0.0030)		
Δ Net capital exports$_{(t-1)}$											-0.0005	-0.0004
											(0.0022)	(0.0023)
Capital per worker (log)	0.1283	0.2052	0.1841*	0.1422	0.0792	0.2771**	0.0701	0.3440***	-0.0276	-0.1146	0.022	-0.0243
	(0.1106)	(0.1258)	(0.1006)	(0.1294)	(0.1166)	(0.1132)	(0.0837)	(0.0931)	(0.1139)	(0.1246)	(0.1360)	(0.1425)
Labor market freedom	0.0402**	0.0400*	0.0524**	0.0643**	0.0153	-0.0159	0.1604***	0.0052	0.0219*	0.0427**	0.0028	-0.0013
	(0.0194)	(0.0231)	(0.0214)	(0.0249)	(0.0216)	(0.0276)	(0.0285)	(0.0449)	(0.0121)	(0.0207)	(0.0181)	(0.0330)
Year fixed effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No
Adj. R-Square	0.9358	0.9389	0.9339	0.9352	0.941	0.9528	0.9569	0.9637	0.0009	0.0246	-0.0158	-0.0247
Observations	338	338	343	343	301	301	234	234	304	304	303	303

Notes: Fixed effects estimations. Robust standard errors are reported in parentheses. The column titles indicate the time lag at which the further explanatory variables are included in the respective specifications. ***/**/* denotes significance at the 1/5/10%-level.

Table A.12: Unemployment rate: different time lags

	t - 1		t		t - 5		t - 10		Δ		Δ t - 1	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Trade openness$_{(t-1)}$ (log)	1.1117*	-0.1146										
	(0.5743)	(1.1248)										
Trade openness (log)			2.1978***	3.6908***								
			(0.6802)	(1.0968)								
Trade openness$_{(t-5)}$ (log)					-3.9650***	-7.3793***						
					(0.8628)	(1.7585)						
Trade openness$_{(t-10)}$ (log)							0.2596	0.3847				
							(0.9063)	(2.0885)				
Δ Trade openness (log)									0.1107	1.4058		
									(1.7127)	(2.1347)		
Δ Trade openness$_{(t-1)}$ (log)											1.6602	-0.5831
											(1.9855)	(2.1802)
Non-OECD imports$_{(t-1)}$ (log)	-0.2408	-3.4516***										
	(0.5573)	(0.6434)										
Non-OECD imports (log)			-0.8746*	-2.3847***								
			(0.4799)	(0.6081)								
Non-OECD imports$_{(t-5)}$ (log)					0.0533	-4.0662***						
					(0.6904)	(0.9183)						
Non-OECD imports$_{(t-10)}$ (log)							-0.43	0.073				
							(0.6688)	(0.7606)				
Δ Non-OECD imports (log)									0.3737	0.1521		
									(0.4833)	(0.5249)		
Δ Non-OECD imports$_{(t-1)}$ (log)											-1.0222	-1.6172*
											(0.7787)	(0.8517)
Net capital exports$_{(t-1)}$	-0.0627***	-0.0434***										
	(0.0180)	(0.0150)										
Net capital exports			-0.0001	0.0213								
			(0.0190)	(0.0170)								
Net capital exports$_{(t-5)}$					-0.1403***	-0.1382***						
					(0.0372)	(0.0322)						
Net capital exports$_{(t-10)}$							-0.0782*	-0.0811**				
							(0.0451)	(0.0379)				
Δ Net capital exports									-0.0022	0.0096		
									(0.0094)	(0.0093)		
Δ Net capital exports$_{(t-1)}$											-0.0012	-0.0013
											(0.0100)	(0.0089)
Output gap	-0.4188***	-0.4524***	-0.4122***	-0.4583***	0.1478**	0.0353	0.0831	-0.0174	-0.3576***	-0.3220***	-0.2635***	-0.3148***
	(0.0503)	(0.0517)	(0.0450)	(0.0516)	(0.0616)	(0.0695)	(0.0872)	(0.0910)	(0.0464)	(0.0504)	(0.0632)	(0.0637)
Labor productivity	0.019	0.1325***	0.0830*	0.0844*	0.0907	0.1795***	0.0501	0.0025	0.1280***	0.0925***	0.0306	0.0723***
	(0.0433)	(0.0468)	(0.0425)	(0.0470)	(0.0646)	(0.0652)	(0.0576)	(0.0562)	(0.0302)	(0.0302)	(0.0231)	(0.0254)
Capital per worker (log)	-3.0568***	-2.2484*	-3.4360***	-2.5729**	0.9599	1.2431	-0.0207	2.0801*	-2.0483*	-2.0013	-1.2164	-0.6988
	(1.1209)	(1.1723)	(1.0687)	(1.1152)	(0.9413)	(0.9191)	(1.4060)	(1.1018)	(1.2278)	(1.2137)	(1.5451)	(1.4661)
Labor market freedom	-0.5863***	-1.0695***	-0.5989***	-1.0550***	0.134	-0.1542	0.2397	0.0928	-0.2124	-0.5441***	-0.2656*	-0.3432*
	(0.1665)	(0.1896)	(0.1550)	(0.1880)	(0.2254)	(0.2427)	(0.2935)	(0.2796)	(0.1515)	(0.2035)	(0.1365)	(0.1760)
Year fixed effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No
Adj. R-Square	0.7803	0.8166	0.806	0.8236	0.6625	0.7342	0.752	0.8252	0.4789	0.5092	0.2349	0.4285
Observations	417	417	417	417	342	342	232	232	394	394	394	394

Notes: Fixed effects estimations. Robust standard errors are reported in parentheses. The column titles indicate the time lag at which the further explanatory variables are included in the respective specifications. ***/**/* denotes significance at the 1/5/10%-level.

Table A.13: Relative supply of human capital: different time lags

	t - 5		t		t - 1		t - 10		Δ		Δ t - 1	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Trade openness$_{(t-5)}$ (log)	6.8433***	7.6690***										
	(1.5372)	(2.4621)										
Trade openness (log)			6.0836***	7.4143***								
			(1.3054)	(1.9614)								
Trade openness$_{(t-1)}$ (log)					6.2382***	7.0125***						
					(1.3692)	(2.0346)						
Trade openness$_{(t-10)}$ (log)							4.7911***	6.7657***				
							(0.7978)	(1.9864)				
Δ Trade openness (log)									0.6379	0.7719		
									(0.5882)	(0.8147)		
Δ Trade openness$_{(t-1)}$ (log)											0.5644	0.4343
											(0.6474)	(0.7378)
Non-OECD imports$_{(t-5)}$ (log)	0.0527	0.3957										
	(0.8178)	(1.0496)										
Non-OECD imports (log)			-0.5376	-1.1709								
			(0.7580)	(1.1223)								
Non-OECD imports$_{(t-1)}$ (log)					-0.2935	-1.0888						
					(0.7521)	(1.1096)						
Non-OECD imports$_{(t-10)}$ (log)							0.7954	1.7873**				
							(0.6576)	(0.7298)				
Δ Non-OECD imports (log)									0.2533	0.253		
									(0.2093)	(0.3447)		
Δ Non-OECD imports$_{(t-1)}$ (log)											0.1776	-0.0491
											(0.1870)	(0.2604)
Net capital exports$_{(t-5)}$	-0.1179***	-0.1184***										
	(0.0446)	(0.0398)										
Net capital exports			-0.0983**	-0.1034**								
			(0.0416)	(0.0447)								
Net capital exports$_{(t-1)}$					-0.0961**	-0.0974**						
					(0.0423)	(0.0443)						
Net capital exports$_{(t-10)}$							-0.0461*	-0.0444				
							(0.0271)	(0.0276)				
Δ Net capital exports									0.0013	0.0013		
									(0.0039)	(0.0052)		
Δ Net capital exports$_{(t-1)}$											0.0057	0.0048
											(0.0057)	(0.0059)
Capital per worker (log)	-0.4884	1.7296	0.1826	2.3028*	-0.2989	1.9967	-0.8531	0.7746	0.1709	0.167	0.01	0.0024
	(1.1509)	(1.2477)	(1.0716)	(1.3014)	(1.1000)	(1.3568)	(0.8425)	(1.2380)	(0.2178)	(0.3600)	(0.2460)	(0.4514)
Multifactor productivity	0.1099	0.2129**	0.1103*	0.2776***	0.1057	0.2520***	0.0222	0.0699	-0.0095	-0.0016	0.001	-0.0049
	(0.0758)	(0.0913)	(0.0663)	(0.0911)	(0.0649)	(0.0910)	(0.0621)	(0.0695)	(0.0101)	(0.0099)	(0.0116)	(0.0133)
Labor market freedom	-0.1923	-0.4630**	0.197	0.1512	0.1693	0.0819	-0.3065*	-0.4665***	0.0334	0.0078	0.021	-0.0042
	(0.1668)	(0.1884)	(0.1582)	(0.1893)	(0.1552)	(0.1960)	(0.1749)	(0.1339)	(0.0448)	(0.0659)	(0.0435)	(0.0650)
Year fixed effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No
Adj. R-Square	0.9072	0.9071	0.8448	0.8404	0.8556	0.8513	0.9752	0.9754	-0.014	-0.0523	-0.0168	-0.0604
Observations	236	236	289	289	285	285	158	158	273	273	269	269

Notes: Fixed effects estimations. Robust standard errors are reported in parentheses. The column titles indicate the time lag at which the further explanatory variables are included in the respective specifications. ***/**/* denotes significance at the 1/5/10%-level.

Table A.14: Relative income of the unemployed: different time lags

	t - 1		t		t - 5		t - 10		Δ		Δ t - 1	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Trade $\text{openness}_{(t-1)}$ (log)	-0.1577***	0.2567***										
	(0.0333)	(0.0531)										
Trade openness (log)			-0.1521***	0.2515***								
			(0.0327)	(0.0530)								
Trade $\text{openness}_{(t-5)}$ (log)					-0.1374***	0.2054***						
					(0.0278)	(0.0474)						
Trade $\text{openness}_{(t-10)}$ (log)							-0.0754***	0.3860***				
							(0.0203)	(0.0487)				
Δ Trade openness (log)									0.007	-0.0362		
									(0.0505)	(0.0636)		
Δ $\text{Trade openness}_{(t-1)}$ (log)											-0.069	-0.0818
											(0.0524)	(0.0639)
$\text{Non-OECD imports}_{(t-1)}$ (log)	0.0685	0.0493										
	(0.0596)	(0.0433)										
Non-OECD imports (log)			0.0247	0.0487								
			(0.0475)	(0.0437)								
$\text{Non-OECD imports}_{(t-5)}$ (log)					0.1001***	0.0276						
					(0.0383)	(0.0267)						
$\text{Non-OECD imports}_{(t-10)}$ (log)							0.0630***	0.007				
							(0.0173)	(0.0178)				
Δ Non-OECD imports (log)									0.0327	0.0152		
									(0.0208)	(0.0311)		
Δ $\text{Non-OECD imports}_{(t-1)}$ (log)											0.0295	-0.0133
											(0.0302)	(0.0296)
$\text{Net capital exports}_{(t-1)}$	-0.0034***	-0.0074***										
	(0.0011)	(0.0014)										
Net capital exports			-0.0029**	-0.0068***								
			(0.0012)	(0.0014)								
$\text{Net capital exports}_{(t-5)}$					-0.0003	-0.0022*						
					(0.0011)	(0.0012)						
$\text{Net capital exports}_{(t-10)}$							-0.0003	-0.0008				
							(0.0012)	(0.0013)				
Δ Net capital exports									-0.0003	-0.0008		
									(0.0005)	(0.0005)		
Δ $\text{Net capital exports}_{(t-1)}$											-0.0003	-0.0004
											(0.0006)	(0.0006)
Left government	0.0001	0.0001	0.0004***	0.0004***	-0.0003*	-0.0002**	-0.0002	-0.0002**	0.0001	0.0001	-0.0002	-0.0002
	(0.0002)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0002)	(0.0001)	(0.0002)	(0.0002)
Voter turnout	0.0025**	0.0009	0.0029***	0.0024**	0.0021**	0.0009	0.0044***	0.0023*	-0.0001	-0.0002	0.0003	-0.0001
	(0.0010)	(0.0010)	(0.0011)	(0.0011)	(0.0011)	(0.0012)	(0.0013)	(0.0013)	(0.0006)	(0.0007)	(0.0004)	(0.0007)
Labor market freedom	-0.0106	0.0202*	-0.0048	0.0127	-0.0043	0.0492***	-0.0177**	-0.0159	0.0066	0.0083	0.0016	0.0068
	(0.0104)	(0.0116)	(0.0092)	(0.0113)	(0.0074)	(0.0114)	(0.0079)	(0.0115)	(0.0047)	(0.0076)	(0.0047)	(0.0074)
Year fixed effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No
Adj. R-Square	0.6179	0.7358	0.6214	0.7348	0.6636	0.76	0.7398	0.7846	-0.006	0.0593	0.0103	0.0665
Observations	303	303	302	302	295	295	275	275	285	285	286	286

Notes: Fixed effects estimations. Robust standard errors are reported in parentheses. The column titles indicate the time lag at which the further explanatory variables are included in the respective specifications. ***/**/* denotes significance at the 1/5/10%-level.

Table A.15: Labor income share: 5-year averages

	(1)	(2)	(3)	(4)	(5)	(6)
Openness (log)	-0.0397***	-0.0928***	-0.0313			
	(0.0099)	(0.0183)	(0.0321)			
Non-OECD imports (log)	-0.0682***	-0.0059	0.0201			
	(0.0197)	(0.0172)	(0.0235)			
Net capital exports	-0.0001	-0.0028***	-0.0021***			
	(0.0017)	(0.0006)	(0.0007)			
Labor productivity	-0.0074	0.0147***	0.0141***			
	(0.0075)	(0.0026)	(0.0032)			
Capital per worker (log)	0.0071	0.0238**	0.0280**			
	(0.0482)	(0.0115)	(0.0117)			
Labor Market freedom	-0.0118**	0.0138**	0.0121*			
	(0.0047)	(0.0055)	(0.0068)			
$\text{Openness}_{(t-1)}$ (log)				-0.0423***	-0.0813***	-0.0039
				(0.0137)	(0.0184)	(0.0603)
$\text{Non-OECD imports}_{(t-1)}$ (log)				-0.0503***	-0.0308	-0.0108
				(0.0163)	(0.0303)	(0.0327)
$\text{Net capital exports}_{(t-1)}$				0.0016	-0.0016	-0.0013
				(0.0026)	(0.0019)	(0.0016)
$\text{Labor productivity}_{(t-1)}$				-0.0158	0.0074*	0.0042
				(0.0109)	(0.0041)	(0.0050)
$\text{Capital per worker}_{(t-1)}$ (log)				-0.0317	0.0401**	0.0312
				(0.0496)	(0.0188)	(0.0225)
$\text{Labor Market freedom}_{(t-1)}$				-0.0129***	0.0133**	0.0116*
				(0.0045)	(0.0058)	(0.0062)
Period fixed effects	No	No	Yes	No	No	Yes
Country fixed effects	No	Yes	Yes	No	Yes	Yes
Adj. R-Square	0.2664	0.9265	0.9291	0.2811	0.9149	0.9115
Observations	101	101	101	79	79	79

Notes: Fixed effects estimations. Robust standard errors are reported in parentheses. ***/**/* denotes significance at the 1/5/10%-level.

Table A.16: Wage dispersion: 5-year averages

	(1)	(2)	(3)	(4)	(5)	(6)
Openness (log)	-0.2126**	0.3597*	0.3550			
	(0.0814)	(0.1823)	(0.2119)			
Non-OECD imports (log)	-0.0715	-0.0151	0.4124			
	(0.2550)	(0.1828)	(0.2851)			
Net capital exports	-0.0553***	-0.0020	-0.0024			
	(0.0116)	(0.0053)	(0.0047)			
Capital per worker (log)	0.2727	0.4054	0.4595			
	(0.3292)	(0.2770)	(0.2979)			
Labor Market freedom	0.1530***	0.0332	0.0594			
	(0.0385)	(0.0586)	(0.0538)			
$\text{Openness}_{(t-1)}$ (log)				-0.1833*	0.4899**	0.2786
				(0.1015)	(0.1900)	(0.2739)
$\text{Non-OECD imports}_{(t-1)}$ (log)				0.0371	-0.1043	0.3553
				(0.2865)	(0.2815)	(0.3218)
$\text{Net capital exports}_{(t-1)}$				-0.0724***	-0.0105	-0.0080
				(0.0213)	(0.0121)	(0.0111)
$\text{Capital per worker}_{(t-1)}$ (log)				0.1242	0.0886	0.2508
				(0.3846)	(0.3000)	(0.2622)
$\text{Labor Market freedom}_{(t-1)}$				0.1559***	0.0691	-0.0188
				(0.0466)	(0.0823)	(0.0741)
Period fixed effects	No	No	Yes	No	No	Yes
Country fixed effects	No	Yes	Yes	No	Yes	Yes
Adj. R-Square	0.3928	0.9404	0.9448	0.3770	0.9476	0.9584
Observations	79	79	79	65	65	65

Notes: Fixed effects estimations. Robust standard errors are reported in parentheses. ***/**/* denotes significance at the 1/5/10%-level.

Table A.17: Unemployment rate: 5-year averages

	(1)	(2)	(3)	(4)	(5)	(6)
Openness (log)	0.2935	2.7983***	5.2459**			
	(0.6151)	(0.9776)	(2.5001)			
Non-OECD imports (log)	1.8562**	-2.0115*	-2.9916*			
	(0.8625)	(1.1712)	(1.7774)			
Net capital exports	-0.0785	-0.0053	0.0291			
	(0.0682)	(0.0378)	(0.0403)			
Output gap	-0.2891	-0.5934***	-0.6459***			
	(0.2072)	(0.1046)	(0.1181)			
Labor productivity	0.1634	-0.5503***	-0.4308			
	(0.2655)	(0.2024)	(0.2762)			
Capital per worker (log)	-3.9316***	-3.5207***	-2.6235*			
	(1.3860)	(1.0381)	(1.3801)			
Labor Market freedom	-0.5225**	-0.6968	-0.8932**			
	(0.2010)	(0.4168)	(0.3542)			
$\text{Openness}_{(t-1)}$ (log)				-0.6478	-2.9140	-8.1867**
				(0.6754)	(1.8018)	(3.1468)
$\text{Non-OECD imports}_{(t-1)}$ (log)				1.3157	-0.5067	-6.7697**
				(1.2888)	(2.5380)	(2.5798)
$\text{Net capital exports}_{(t-1)}$				-0.2629***	-0.1801	-0.1179
				(0.0975)	(0.1103)	(0.0725)
$\text{Output gap}_{(t-1)}$				0.3843	0.3747***	0.3960***
				(0.2448)	(0.1109)	(0.1254)
$\text{Labor productivity}_{(t-1)}$				0.4444	0.4071	0.9094***
				(0.3522)	(0.3173)	(0.3243)
$\text{Capital per worker}_{(t-1)}$ (log)				-4.5769**	-1.7086	0.1177
				(1.9403)	(1.1432)	(1.2701)
$\text{Labor Market freedom}_{(t-1)}$				-0.8825***	-0.8548	-0.5239
				(0.2771)	(0.6188)	(0.6890)
Period fixed effects	No	No	Yes	No	No	Yes
Country fixed effects	No	Yes	Yes	No	Yes	Yes
Adj. R-Square	0.2732	0.8315	0.8465	0.3045	0.8246	0.8630
Observations	85	85	85	63	63	63

Notes: Fixed effects estimations. Robust standard errors are reported in parentheses. ***/**/* denotes significance at the 1/5/10%-level.

Table A.18: Relative supply of human capital: 5-year averages

	(1)	(2)	(3)	(4)	(5)	(6)
Openness (log)	-3.1645***	7.3191*	7.7484			
	(0.8236)	(3.9009)	(6.7579)			
Non-OECD imports (log)	2.6144***	-1.7237	-2.4604			
	(0.7769)	(2.5720)	(3.2688)			
Net capital exports	0.0106	-0.2784	-0.2692			
	(0.1234)	(0.1783)	(0.1844)			
Capital per worker (log)	5.3214***	1.9551	2.5982			
	(1.3305)	(3.5271)	(3.5787)			
Multifactor productivity	0.6625	0.7060	0.8278			
	(0.4523)	(0.4486)	(0.5183)			
Labor Market regulation	0.8053***	0.1423	-0.0037			
	(0.2236)	(0.5637)	(0.5797)			
$\text{Openness}_{(t-1)}$ (log)				-3.1144***	9.6710**	14.6302
				(1.0554)	(4.0921)	(10.5525)
$\text{Non-OECD imports}_{(t-1)}$ (log)				3.3589***	-0.6937	-0.4406
				(1.0733)	(2.2525)	(2.5817)
$\text{L.Net capital exports}_{(t-1)}$				-0.0982	-0.3116	-0.3352
				(0.1612)	(0.1879)	(0.2002)
$\text{Capital per worker}_{(t-1)}$ (log)				6.2191***	-1.8412	0.6593
				(1.5445)	(3.4528)	(4.2937)
$\text{Multifactor productivity}_{(t-1)}$				0.3553	0.7652	0.9321
				(0.5030)	(0.5007)	(0.5522)
$\text{Labor Market regulation}_{(t-1)}$				0.7832**	-0.6658	-0.9956*
				(0.3252)	(0.5542)	(0.5706)
Period fixed effects	No	No	Yes	No	No	Yes
Country fixed effects	No	Yes	Yes	No	Yes	Yes
Adj. R-Square	0.5725	0.8124	0.7951	0.5840	0.8823	0.8806
Observations	62	62	62	47	47	47

Notes: Fixed effects estimations. Robust standard errors are reported in parentheses. ***/**/* denotes significance at the 1/5/10%-level.

Table A.19: Relative income of the unemployed: 5-year averages

	(1)	(2)	(3)	(4)	(5)	(6)
Openness (log)	-0.0273	-0.1861*	0.3175***			
	(0.0290)	(0.0960)	(0.1033)			
Non-OECD imports (log)	-0.1833***	0.2226	0.1035			
	(0.0406)	(0.1641)	(0.0870)			
Net capital exports	-0.0043	-0.0014	-0.0077**			
	(0.0046)	(0.0037)	(0.0037)			
Left government	-0.0005	0.0003	0.0003			
	(0.0004)	(0.0004)	(0.0003)			
Voter turnout	-0.0027*	0.0074	0.0029			
	(0.0014)	(0.0044)	(0.0031)			
Labor Market freedom	-0.0203	-0.0449	0.0387			
	(0.0137)	(0.0278)	(0.0328)			
Openness$_{(t-1)}$ (log)				-0.0147	-0.1293**	0.3203***
				(0.0252)	(0.0633)	(0.0867)
Non-OECD imports$_{(t-1)}$ (log)				-0.1697***	0.1110	0.0048
				(0.0429)	(0.0699)	(0.0549)
Net capital exports$_{(t-1)}$				-0.0052	-0.0030	-0.0065
				(0.0054)	(0.0041)	(0.0047)
Left government$_{(t-1)}$				-0.0004	-0.0003	-0.0002
				(0.0004)	(0.0003)	(0.0002)
Voter turnout$_{(t-1)}$				-0.0036**	0.0036	-0.0024
				(0.0015)	(0.0034)	(0.0031)
Labor Market freedom$_{(t-1)}$				-0.0349***	-0.0118	0.0442
				(0.0130)	(0.0233)	(0.0267)
Period fixed effects	No	No	Yes	No	No	Yes
Country fixed effects	No	Yes	Yes	No	Yes	Yes
Adj. R-Square	0.1776	0.4962	0.6905	0.1797	0.6285	0.7533
Observations	70	70	70	66	66	66

Notes: Fixed effects estimations. Robust standard errors are reported in parentheses. ***/**/* denotes significance at the 1/5/10%-level.

Table A.20: Seemingly unrelated regression: without fixed effects

	OLS					SUR				
	Labor inc.	Wage dispers.	Unempl. rate	Supply hum. cap.	Inc. unempl.	Labor inc.	Wage dispers.	Unempl. Rate	Supply hum. cap.	Inc. unempl.
Trade openness$_{(t-1)}$ (log)	-0.0054	-0.4659***	1.2936**		0.0565***	-0.0019	-0.3892***	0.9015*		0.0393**
	(0.0055)	(0.0778)	(0.5368)		(0.0170)	(0.0060)	(0.0834)	(0.4835)		(0.0185)
Trade openness$_{(t-5)}$ (log)				-3.7738***					-3.1610***	
				(0.8340)					(0.6704)	
Non-OECD imports$_{(t-1)}$ (log)	-0.0034	0.0305	0.3594		-0.1194***	-0.0003	0.0663	0.0707		-0.1387***
	(0.0098)	(0.1226)	(0.5811)		(0.0304)	(0.0089)	(0.1220)	(0.7160)		(0.0274)
Non-OECD imports$_{(t-5)}$ (log)				4.6217***					5.2450***	
				(1.2637)					(1.0194)	
Net capital exports$_{(t-1)}$	-0.0032***	0.0015	-0.1584**		-0.0107***	-0.0037***	-0.0132	-0.0937*		-0.0127***
	(0.0007)	(0.0088)	(0.0776)		(0.0022)	(0.0007)	(0.0092)	(0.0555)		(0.0019)
Net capital exports$_{(t-5)}$				0.0032					-0.005	
				(0.1095)					(0.0829)	
Labor productivity$_{(t-1)}$	-0.0066***		0.1403			-0.0072***		0.1366		
	(0.0014)		(0.1195)			(0.0014)		(0.1104)		
Capital per worker$_{(t-1)}$ (log)	-0.1169***	0.7020***	-0.015			-0.1312***	0.3764*	1.7043		
	(0.0160)	(0.1713)	(1.3396)			(0.0146)	(0.1977)	(1.2532)		
Capital per worker$_{(t-5)}$ (log)				7.3988***					4.9209***	
				(1.7312)					(1.3805)	
Labor market freedom$_{(t-1)}$	-0.0061***	0.2381***	-0.6203***		-0.0396***	-0.0064***	0.2225***	-0.5588***		-0.0371***
	(0.0015)	(0.0180)	(0.1161)		(0.0064)	(0.0014)	(0.0192)	(0.1121)		(0.0056)
Labor market freedom$_{(t-5)}$				0.6662***					0.7161***	
				(0.1751)					(0.1574)	
Output gap$_{(t-1)}$			-0.5565***					-0.5651***		
			(0.1239)					(0.0807)		
Multifactor productivity$_{(t-5)}$				0.3219					0.0759	
				(0.2176)					(0.1740)	
Left government$_{(t-1)}$					-0.0007***					-0.0004**
					(0.0002)					(0.0002)
Voter turnout$_{(t-1)}$					-0.0046***					-0.0032***
					(0.0006)					(0.0006)
Adj. R-Square	0.493	0.7138	0.3738	0.6262	0.3339					
Observations	139	139	139	139	139	139				

Notes: OLS and SUR estimations based on a common sample. Robust standard errors are reported in parentheses. ***/**/* denotes significance at the 1/5/10%-level.

Table A.21: Seemingly unrelated regression: country fixed effects

	OLS					SUR				
	Labor inc.	Wage dispers.	Unempl. rate	Supply hum. cap.	Inc. unempl.	Labor inc.	Wage dispers.	Unempl. Rate	Supply hum. cap.	Inc. unempl.
Trade openness$_{(t-1)}$ (log)	-0.0269**	0.2710**	0.9013		0.036	-0.0233*	0.2341**	0.705		-0.0007
	(0.0122)	(0.1224)	(1.5566)		(0.0742)	(0.0124)	(0.0922)	(1.5570)		(0.0420)
Trade openness$_{(t-5)}$ (log)				9.9854***					8.7328***	
				(2.0575)					(1.1367)	
Non-OECD imports$_{(t-1)}$ (log)	-0.0031	0.058	-0.5688		-0.1039**	-0.0083	0.1303*	-0.054		-0.0843**
	(0.0096)	(0.0727)	(1.6729)		(0.0401)	(0.0101)	(0.0775)	(1.2463)		(0.0407)
Non-OECD imports$_{(t-5)}$ (log)				-0.3444					0.6867	
				(1.4147)					(1.1908)	
Net capital exports$_{(t-1)}$	-0.0025***	-0.0006	-0.1203**		-0.0061***	-0.0026***	0.0013	-0.1090**		-0.0047***
	(0.0006)	(0.0032)	(0.0536)		(0.0016)	(0.0004)	(0.0028)	(0.0461)		(0.0014)
Net capital exports$_{(t-5)}$				-0.1671**					-0.0789*	
				(0.0720)					(0.0464)	
Labor productivity$_{(t-1)}$	-0.0017**		0.0313			-0.0015**		0.0154		
	(0.0009)		(0.1077)			(0.0007)		(0.0873)		
Capital per worker$_{(t-1)}$ (log)	-0.0197	0.1485	-3.3041			-0.0166	0.072	-4.6845		
	(0.0179)	(0.1220)	(3.1117)			(0.0153)	(0.1083)	(3.1193)		
Capital per worker$_{(t-5)}$ (log)				-1.8775					-0.9507	
				(2.1236)					(1.5419)	
Labor market freedom$_{(t-1)}$	-0.0034	0.0276*	-0.1776		-0.0006	-0.0032	0.0272*	-0.1552		-0.0004
	(0.0024)	(0.0164)	(0.2885)		(0.0093)	(0.0022)	(0.0165)	(0.2707)		(0.0087)
Labor market freedom$_{(t-5)}$				-0.0843					-0.0937	
				(0.3205)					(0.2345)	
Output gap$_{(t-1)}$			-0.5148***					-0.4534***		
			(0.1290)					(0.1025)		
Multifactor productivity$_{(t-5)}$				-0.0191					-0.1056	
				(0.1214)					(0.0960)	
Left government$_{(t-1)}$					-0.0002					-0.0002
					(0.0002)					(0.0001)
Voter turnout$_{(t-1)}$					0.0015					0.0006
					(0.0015)					(0.0009)
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R-Square	0.8874	0.9791	0.6973	0.9202	0.8158					
Observations	139	139	139	139	139	139				

Notes: OLS and SUR estimations based on a common sample. Country fixed effects are included. Robust standard errors are reported in parentheses. ***/**/* denotes significance at the 1/5/10%-level.

Appendix B

Policy preferences of German voters

B.1 Data sources and definitions

Table B.1: Description of variables used in the analysis of attitudes toward progressive taxation (chapter 11)

Variable	**Unit**	**Explanation**	**Categories**
Tax Progression	Dummy	Respondent's preference for progressive tax rates.	1, if the respondent favors a (steep) progression.
Tax Preference	Ordinal scale	Respondent's tax rate preference	1, if the respondent favors regressive taxation. 2, if the respondent favors a proportional taxation. 3, if the respondent favors a progressive taxation.
Low Income	Dummy	Respondent's placement in the income distribution.	1, if the respondent belongs to the 25^{th} income percentile (i.e. has less than 750 Euro net income per month).
Intermed. Income	Dummy		1, if the respondent has a monthly net income between 750 and 1500 Euro.
High Income	Dummy		1, if the respondent belongs to the 75^{th} income percentile (i.e. has at least 1500 Euro net income per month).
Equivalent income	Continuous variable	Respondent's household income adjusted for household size.	equivalent income = $\text{household net income} \,/\, \sqrt{\text{no. persons in household}}$
Social Mobility	Ordinal scale	Change in the respondent's position in the social stratum during the last ten years.	Negative (positive) value: experience of downward (upward) social mobility
Low Education	Dummy	Respondent's level of education.	1, if the respondent has no or a lower secondary school leaving certificate (usually nine years of schooling or less).
Secondary Education	Dummy		1, if the respondent has an intermediate secondary school leaving certificate.
Upper Sec. Education	Dummy		1, if the respondent has an upper secondary school leaving certificate.
University	Dummy		1, if the respondent has an university (for applied science) degree.

Continued on next page

Table B.1 – continued from previous page

Variable	Unit	Explanation	Categories
Importance Politics	Dummy	Politics strongly influence our lives.	1, if the respondent approves.
Need	Dummy	Decent income even without achievement.	1, if the respondent approves.
Effort	Dummy	Differences in social standing as incentive for individual achievement.	1, if the respondent approves.
Democracy	Dummy	Satisfaction with the German democracy.	1, if the respondent is (fully) satisfied.
Social Differences	Dummy	The social differences are just.	1, if the respondent approves.
Ordinary People	Dummy	Life for ordinary people is not getting worse.	1, if the respondent approves.
Adequate Wage	Dummy	Just pay given skills and effort.	1, if the respondent approves.
Age	Discrete variable	Age of the respondent.	18 – 95 years
Female	Dummy	Sex of the respondent.	1, if the respondent is female.
East	Dummy	Origin of the respondent.	1, if the respondent has been born in the former GDR.
Unemployed	Dummy	Employment status of the respondent.	1, if the respondent is unemployed.
Not Employed	Dummy		1, if the respondent is not employed.
Self-Employed	Dummy		1, if the respondent is self-employed.
Public Employee	Dummy	Employment of the respondent in the public sector.	1, if the respondent is a public employee.
White Collar	Dummy	Type of respondent's job.	1, if the respondent is a white collar worker.
Blue Collar	Dummy		1, if the respondent is a blue collar worker.
Legally married	Dummy	Marital Status of the respondent.	1, if the respondent is legally married (i.e. either living together or separated spouses).
Not married	Dummy		1, if the respondent is not married (i.e. single, divorced or widowed).
No. Children (hh)	Discrete variable	Number of minor children living in the respondent's household.	0 – 6 children
No. Persons (hh)	Discrete variable	Number of persons living in the respondent's household.	1 – 11 persons

Continued on next page

Table B.1 – continued from previous page

Variable	Unit	Explanation	Categories
Religiosity	Dummy	Religious denomination of the respondent.	1, if the respondent belongs to an institutionalized religious community.
Partner: not employed	Dummy	Employment status of the respondent's partner.	1, if the respondent's partner is not employed.
Partner: part-time worker	Dummy		1, if the respondent's partner works part-time.
Partner: full-time worker	Dummy		1, if the respondent's partner works full-time.

Table B.2: Description of variables used in the analysis of labor market policy preferences (chapter 12)

Variable	**Unit**	**Explanation**	**Categories**
Cutting social benefits	Dummy	Cut of social benefits.	1, if the respondent approves.[a]
Cutting unemployment benefits	Dummy	Cut of unemployment benefits.	1, if the respondent approves.[b]
Increase of pension age	Dummy	Increase of pension age in order to solve the problem of the public pension system.	1, if the respondent approves.[c]
Cutting subsidies to declining industries	Dummy	Cut of subsidies to declining industries.	1, if the respondent approves.[b]
Phasing out employment programs	Dummy	Cut financing of public employment programs.	1, if respondent approves.[b]
Liberalizing employment protection	Dummy	Liberalization of employment protection in order to avoid unemployment.	1, if the respondent would accept a terminable working contract.[c]
Age	Discrete variable	Age of the respondent.	18-95[a] (94[b,c])
Income	Continuous variable	Monthly net income of the respondent (in EURO).	0-12500[a] (8000[b,c])
Insecure	Dummy	Job insecurity of the respondent.	1, if the respondent is afraid of becoming unemployed.
Unemployed	Dummy	Employment status of the respondent.	1, if the respondent is currently unemployed.
Civil servant	Dummy	Occupational position of the respondent: Civil servant.	1, if the respondent is a civil servant.
Self-employed	Dummy	Occupational position of the respondent: Entrepreneur or independent professional.	1, if the respondent is self-employed.
University	Dummy	Respondent's educational level.	1, if the respondent has a university (for applied science) degree.
	Dummy	Politics strongly influence our lives.	1, if the respondent approves.[a]
Politically informed	Dummy	The respondent is informed about the major political problems in Germany.	1, if the respondent is informed.[b]
	Dummy	Respondent collects information about candidates before an election.	1, if the respondent informs himself.[c]
Need	Dummy	Decent income even without achievement.	1, if the respondent approves.[a]

Continued on next page

Table B.2 – continued from previous page

Variable	Unit	Explanation	Categories
Ordinary People	Dummy	Life for ordinary people is getting worse.	1, if the respondent approves.
Effort	Dummy	Income differences increase the incentive for individual effort.	1, if respondent approves.[a]
	Dummy	Future of the people in the East depends on the will to work.	1, if the respondent approves.[b,c]
Procedural fairness	Dummy	Satisfaction with democracy in Germany.	1, if the respondent is satisfied.[a]
	Dummy	Politicians are interested in problems of common people.	1, if the respondent approves.[b,c]
East	Dummy	Origin of the respondent.	1, if the respondent is born in the former GDR.[a]
	Dummy	State in which the respondent spent his youth.	1, if the respondent spent his youth in the former GDR.[b,c]
Religion	Dummy	Religious denomination of the respondent.	1, if the respondent belongs to an institutionalized religious community.
Female	Dummy	Sex of the respondent.	1, if the respondent is female.
Married	Dummy	Marital status of the respondent.	1, if the respondent is married.
Children	Dummy	Children of the respondent.	1, if the respondent has own children.

[a]: ALLBUS 2000, [b]: ISSP Role of Government (ALLBUS 2006), [c]: ISSP Work Orientation (ALLBUS 2006)

Table B.3: Description of variables used in the analysis of pension reform preferences (chapter 13)

Variable	**Unit**	**Explanation**	**Categories**
Increase of pension age preference	Dummy	Increase of pension age to solve the problems of the public pension system.	1, if the respondent approves.
Higher contribution preference	Dummy	Higher contributions to solve the problems of the public pension system.	1, if the respondent approves.
Cutting pension preference	Dummy	Lower pension payment from public pension system as solution of the current and facing problems.	1, if the respondent approves.
Age < 25	Dummy	Younger than 25 years.	1, for respondents aged 18 to 24.
Age ≥ 25, <45	Dummy	Between 25 and 45 years old.	1, for respondents aged 25 to 45.
Age ≥ 45, <65	Dummy	Between 45 and 65 years old.	1, for respondents aged 45 to 65.
Job insecure	Dummy	Job insecurity of the respondent.	1, if the respondent is employed and is afraid of becoming unemployed.
Unemployed	Dummy	Employment status of the respondent.	1, if the respondent is currently unemployed.
Not employed	Dummy		1, if the respondent is currently not employed.
Civil servant	Dummy	Occupational position of the respondent: civil servant.	1, if the respondent is a civil servant.
Entrepreneur	Dummy	Occupational position of the respondent: entrepreneur or self-employed professional.	1, if the respondent is self-employed.
Sick	Dummy	Health condition of the respondent.	1, if the respondent feels not (very) healthy.
University	Dummy	Respondent's educational level. (for applied science) degree.	1, if the respondent has a university
Policy interest	Dummy	Respondent claims to be interested in politics.	1 if the respondent approves.
Member of union	Dummy	Membership in a trade union.	1, if the respondent is a member of a trade union.
Youth in East	Dummy	State in which the respondent spent his youth.	1, if the respondent spent his youth in the former GDR.
Female	Dummy	Sex of the respondent.	1, if the respondent is female.
Married	Dummy	Marital status of the respondent.	1, if the respondent is married.
Like work	Dummy	Willingness to work, even if there is no need for the money.	1, if the respondent (strongly) approves.
Work willingness	Dummy	Willingness to work harder to support the firm or organization.	1, if the respondent is employed and is willing to work harder for firm.

Continued on next page

Table B.3 – continued from previous page

Variable	Unit	Explanation	Categories
Municipal suffrage	Dummy	Reform proposal: Municipal suffrage for foreigners.	1, if the respondent approves.
Islam teaching	Dummy	Reform proposal: Islam teaching at German state schools.	1, if the respondent approves.
Children	Dummy	Children living in the respondent's household.	1, if the respondent lives at least with one child.
Blue collar	Dummy	Respondent's job position.	1, if the respondent is employed and is a blue collar worker.
Hard Job	Dummy	Respondent has a physically demanding job.	1, if the respondent is employed and has to perform a physically demanding job.
Left	Dummy	Self-assessment of respondent's ideology.	1, if the respondent classifies himself as left.
Job match	Dummy	Usefulness of respondent's past work experience and/or job skills for present job.	1 if respondent can widely use past work experience/ job skills, 0 otherwise.

Table B.4: Description of variables used in the analysis of belief formation (chapter 14)

Variable	**Explanation**	**Data set**
Effort pays off	1: respondent states that *a high level of effort pays off for the society as well as for oneself*; 0: otherwise	GDR 1988/89
Luck	1: respondent states that *what you achieve in life is mainly a matter of luck*; 0 otherwise	GSOEP 1994-96, 1999
GDR media	1: respondent *feels (very) well informed about the recent events by GDR press, radio and television*; 0: otherwise	GDR 1988/89
Life GDR	1: respondent *likes living in the GDR*; 0 otherwise	GDR 1988/89
Marx-Lenin	1: respondent *agrees with Marxist-Leninist world view*; 0: otherwise	GDR 1988/89
Socialist economies	1: respondent is *confident in the economic development of socialist countries up to the year 2000.*; 0: otherwise	GDR 1988/89
Socialist democracy	1: respondent is *confident in the development of socialist democracy in the GDR up to the year 2000.*; 0: otherwise	GDR 1988/89
Social security GDR	1: respondent is *satisfied with social security in the GDR*; 0 otherwise	GSOEP 1990
Democracy GDR	1: respondent is *satisfied with the democracy in the GDR*; 0 otherwise	GSOEP 1990
Life GDR	1: respondent is (totally) *satisfied with the general standard of living in the GDR*; 0 otherwise	GSOEP 1991-94
Happiness	1: respondent is (totally) *satisfied with life in general*; 0 otherwise	GSOEP 1990-99
Expected happiness in 5 yrs.	1: respondent *expects to be (totally) satisfied with general life in 5 years*; 0 otherwise	GSOEP 1990-99
Dresden	1: respondent lives in the district of Dresden; 0 otherwise	GDR 1988/89
	1: respondent has lived in the district of Dresden in 1990; 0: in other parts of the GDR excl. Greifswald-Stralsund	GSOEP 1990
Age	Age of the respondent	GDR 1988/89; GSOEP 1990-99
Female	1: respondent is female; 0: otherwise	GDR 1988/89; GSOEP 1990-99
Never married	1: respondent has never been married (i.e. is single); 0 otherwise	GDR 1988/89; GSOEP 1990-99
Married	1: respondent is married; 0: otherwise	GDR 1988/89; GSOEP 1990-99
Widowed or divorced	1: respondent is either widowed or divorced; 0 otherwise	GDR 1988/89; GSOEP 1990-99
Children	1: respondent has children; 0 otherwise	GDR 1988/89
No. persons in household	Number of persons living in the respondent's household.	GSOEP 1990-99
No. children in household	Number of children living in the respondent's household.	GSOEP 1990-99
University	1: respondent has an university degree; 0 otherwise	GDR 1988/89; GSOEP 1990-99
High education	1: respondent has finished 12^{th} (13^{th}) grade; 0 otherwise	GDR 1988/89 (GSOEP 1990-99)
Intermed. education	1: respondent has finished 10^{th} (at least 9^{th}) grade; 0 otherwise	GDR 1988/89 (GSOEP 1990-99)
Low education	1: respondent has finished 8^{th} (9^{th}) grade or left school without a degree; 0 otherwise	GDR 1988/89 (GSOEP 1990-99)
Farther's education	Level of education of respondent's farther	GSOEP 1990-99
Net income	Respondent's net income: 1 (500 Mark) - 9 (more than 1500 Mark)	GDR 1988/89
Log. household income	Logarithm of respondent's yearly real available household income: 0 - 256,099 Euro	GSOEP 1992-1999
Self-employed	1: respondent is self-employed; 0 otherwise	GSOEP 1990-99
Civil servant	1: respondent is a civil servant; 0 otherwise	GSOEP 1990-99
Pensioner	1: respondent is a pensioner; 0 otherwise	GSOEP 1990-99
Not employed	1: respondent is not employment; 0 otherwise	GSOEP 1990-99
Unemployed	1: respondent is unemployed; 0 otherwise	GSOEP 1990-99
Unemployment experience	Total experience of unemployment until the survey year (in years).	GSOEP 1990-99
West Germany	1: respondent currently lives in West Germany; 0 otherwise	GSOEP 1991-99
Population density	Inhabitants per km^2 in the respondent's district	GDR Statistical Yearbook 1990
Industrial employment	Industrial employment as a share of total employment	GDR Statistical Yearbook 1989
Agricultural employment	Agricultural employment as a share of total employment	GDR Statistical Yearbook 1989
Unemployment rate (state)	Unemployment rate in the respondent's state of residence	INKAR (various years)
Theater	1: respondent has visited a theater during the past month; 0 otherwise	GDR 1988/89
Cinema	1: respondent has visited a cinema during the past month; 0 otherwise	GDR 1988/89
Museum	1: respondent has visited a museum during the past month; 0 otherwise	GDR 1988/89
Mother: Catholic	1: respondent's mother is catholic; 0 otherwise	GSOEP 1990-1990
Mother: Protestant	1: respondent's mother is protestant; 0 otherwise	GSOEP 1990-1990
Mother: Other	1: respondent's mother is religious but neither catholic nor protestant; 0 otherwise	GSOEP 1990-1990
Mother: Not religious	1: respondent's mother is not religious; 0 otherwise	GSOEP 1990-1990
Respondent (1990): Catholic	1: respondent's stated to be catholic in 1990; 0 otherwise	GSOEP 1990
Respondent (1990): Protestant	1: respondent's stated to be protestant in 1990; 0 otherwise	GSOEP 1990
Respondent (1990): Other	1: respondent's stated to be religious but neither catholic nor protestant in 1990; 0 otherwise	GSOEP 1990
Respondent (1990): Not religious	1: respondent's stated to be not relgious in 1990; 0 otherwise	GSOEP 1990

Continued on next page

Table B.4 – continued from previous page

Variable	Explanation	Data set
Low household income	1: In year 1990 and 1991 *and* respondent belongs in 1992 to the 25 percent with the lowest household income; 0 otherwise	GSOEP 1990-91
Intermed. household income	1: In year 1990 and 1991 *and* respondent belongs in 1992 to the 50 percent with the medium household income; 0 otherwise	GSOEP 1990-91
High household income	1: In year 1990 and 1991 *and* respondent belongs in 1992 to the 25 percent with the highest household income; 0 otherwise	GSOEP 1990-91
Industrial production	Industrial production of the district as a share of GDR total industrial production	GDR Statistical Yearbook 1989
Working age population	Working age population as a share of total district population	GDR Statistical Yearbook 1989
High educated workers	Workers with university degree as a share of district working population	Kind(1997)
Border district	1: respondent lives in a district located at the inner-German border; 0 otherwise	
Distance to Berlin	Distance between the district capital and Berlin (in km)	
Theater visitors	Number of theater visitors as a percentage of total district population	GDR Statistical Yearbook 1989
Population density	Inhabitants per km^2 in the respondent's regional planning unit	INKAR (various years)
Inhabitants older than 65	Inhabitants older than 65 as a share of total regional population	INKAR (various years)
Unemployment rate	Unemployment rate in the respondent's region	INKAR (various years)
Average industrial wage	Average gross wages in the respondent's region	INKAR (various years)
GDP per capita	GDP per capita in the respondent's region	INKAR (various years)

B.2 Additional information

Table B.5: Descriptive statistics additional variables (chapter 11)

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
Tax preference	1364	2.780526	0.449161	1	3
Income < 300	2911	0.0447	0.2067	0	1
Income 300-500	2911	0.1010	0.3013	0	1
Income 500-750	2911	0.1397	0.3467	0	1
Income 750-1000	2911	0.1403	0.3473	0	1
Income 1000-1250	2911	0.1608	0.3674	0	1
Income 1250-1500	2911	0.1176	0.3222	0	1
Income 1500-2000	2911	0.1488	0.3559	0	1
Income 2000-2500	2911	0.0678	0.2515	0	1
Income 2500-3000	2911	0.0352	0.1842	0	1
Income >3000	2911	0.0443	0.2057	0	1
Equivalence income	2511	2682.261	1895.241	250	56568.54
White Collar	3797	0.2274	0.4192	0	1
Blue Collar	3797	0.1594	0.3661	0	1
Legally married	3796	0.6260219	0.4839217	0	1
Not married	3796	0.3739781	0.4839217	0	1
No. Children (hh)	3693	0.5480	0.9085	0	6
No. Persons (hh)	3778	2.6689	1.3322	1	11
Religiosity	3778	0.7626	0.4255	0	1
Partner: not employed	452	0.2516881	0.4344638	0	1
Partner: part-time worker	452	0.0735876	0.2613879	0	1
Partner: full-time worker	452	0.6747243	0.4689969	0	1
Spouse*: part-time worker	2352	0.1221584	0.3275383	0	1
Spouse*: full-time worker	2352	0.4480498	0.4973996	0	1
Spouse*: not employed	2352	0.4297918	0.4951515	0	1

* This variables are used as the employment status of the respondent's partner for the sample of legally married individuals in Table 11.10.

Table B.6: Descriptive statistics - GDR 1988/89 (chapter 14)

	All observations					Treatment group			Control group								
						Dresden			GDR			excl. Berlin			Leipzig & Karl-Marx-Stadt		
Variables	Obs.	Mean	Std.Dev.	Min.	Max.	Obs.	Mean	Std.Dev.	Obs.	Mean	Std.Dev.	Obs.	Mean	Std.Dev.	Obs.	Mean	Std.Dev.
Baseline regression																	
Effort pays off	3381	0.58	0.49	0	1	736	0.53	0.50	2645	0.60	0.49	2254	0.61	0.49	860	0.62	0.49
Age	3497	23.09	6.38	15	50	770	23.36	6.36	2727	23.02	6.38	2314	22.97	6.19	891	24.13	6.74
Female	3526	0.48	0.50	0	1	777	0.51	0.50	2749	0.47	0.50	2332	0.48	0.50	900	0.60	0.49
Never married	3525	0.68	0.47	0	1	777	0.65	0.48	2748	0.69	0.46	2331	0.69	0.45	900	0.56	0.50
Married	3525	0.28	0.45	0	1	777	0.32	0.47	2748	0.27	0.45	2331	0.27	0.45	900	0.40	0.49
Divorced/Widowed	3525	0.04	0.19	0	1	777	0.04	0.18	2748	0.04	0.20	2331	0.04	0.19	900	0.04	0.20
Children	3507	0.33	0.47	0	1	773	0.38	0.49	2734	0.31	0.46	2318	0.31	0.46	891	0.40	0.49
Net income	2742	3.91	1.87	1	9	594	4.02	1.87	2148	3.88	1.86	1859	3.80	1.83	730	3.86	1.86
Low education	3531	0.09	0.29	0	1	778	0.09	0.28	2753	0.10	0.29	2336	0.09	0.29	903	0.06	0.25
Intermed. education	3531	0.80	0.40	0	1	778	0.81	0.40	2753	0.80	0.40	2336	0.81	0.39	903	0.81	0.40
High education	3531	0.10	0.31	0	1	778	0.11	0.31	2753	0.10	0.30	2336	0.10	0.30	903	0.13	0.34
University	3479	0.06	0.23	0	1	769	0.08	0.27	2710	0.05	0.22	2297	0.05	0.22	893	0.07	0.25
Population density	3563	555.81	958.78	68	3174	784	254	0	2779	640.95	1070.39	2360	191.23	85.04	910	291.65	15.65
Industrial employment	3563	38.50	7.73	24.3	48.1	784	42.8	0	2779	37.28	8.36	2360	39.41	7.24	910	45.60	3.78
Agricultural employment	3563	9.37	5.05	1	22.2	784	8.1	0	2779	9.73	5.66	2360	11.28	4.67	910	6.70	1.06
Addtional variables																	
GDR media	3455	0.36	0.48	0	1	758	0.27	0.44	2697	0.39	0.49	877	0.42	0.49			
Life GDR	3520	0.91	0.28	0	1	775	0.85	0.35	2745	0.93	0.26	2327	0.93	0.26	897	0.92	0.27
Socialist economies	3527	0.45	0.50	0	1	773	0.38	0.49	2754	0.47	0.50	2337	0.50	0.50	899	0.49	0.50
Socialist democracy	3524	0.52	0.50	0	1	772	0.46	0.50	2752	0.53	0.50	2333	0.55	0.50	898	0.58	0.50
Marx-Lenin	3516	0.65	0.48	0	1	775	0.60	0.49	2741	0.66	0.48	2323	0.66	0.47	894	0.69	0.46
Industrial production	3563	8.38	2.82	2.5	12.5	784	10.7	0	2779	7.72	2.87	2360	8.12	2.95	910	11.07	2.16
Working age population	3563	64.39	1.41	62.9	67.5	784	62.9	0	2779	64.82	1.32	2360	64.34	0.73	910	63.53	0.51
High educated workers	3563	20.62	4.69	17	33	784	20.6	0	2779	20.63	5.31	2360	18.43	1.11	910	18.13	1.70
Border district	3563	0.69	0.46	0	1	784	0	0	2779	0.88	0.33	2360	0.86	0.35	2360	0.70	0.46
Distance to Berlin	3563	156.78	67.37	0	283.45	784	165.41	0	2779	154.34	76.10	2360	181.74	42.88	910	178.62	19.03
Theater visitors	3563	0.002	0.0004	0.0008	0.003	784	0.0019	0	2779	0.0017	0.00045	2360	0.0015	0.0002	910	0.0014	0.00002
Theater	1166	0.22	0.42	0	1	257	0.25	0.43	909	0.22	0.41	771	0.18	0.39	302	0.15	0.36
Cinema	3522	0.43	0.50	0	1	777	0.50	0.50	2745	0.41	0.49	2329	0.38	0.49	898	0.37	0.48
Museum	1165	0.42	0.49	0	1	257	0.45	0.50	908	0.41	0.49	771	0.40	0.49	304	0.41	0.49

Table B.7: Descriptive statistics - SOEP data (chapter 14)

	All observations					Treatment group: Dresden			Control group: excl. Greifswald-Stralsund			Control group: excl. Berlin & Greifswald-Stralsund			Control group: Saxony			Control group: East		
Variable	Obs	Mean	Std.Dev.	Min	Max	Obs	Mean	Std.Dev.	Obs	Mean	Std.Dev.	Obs	Mean	Std.Dev.	Obs	Mean	Std.Dev.	Obs	Mean	Std.Dev.
Baseline regression																				
Luck	13910	0.22	0.41	0	1	1385	0.25	0.43	11819	0.22	0.41	10928	0.22	0.42	2731	0.22	0.42	3018	0.22	0.42
Age	36715	43.54	16.4	17	98	3734	42.39	16.16	31786	43.65	16.42	29383	43.74	16.52	7284	45.13	16.62	8159	44.64	16.80
Female	36715	0.52	0.50	0	1	3734	0.53	0.50	31786	0.52	0.50	29383	0.52	0.50	7284	0.53	0.50	8159	0.52	0.50
Father's education	31059	2.31	0.64	0	4	3252	2.35	0.65	26892	2.30	0.63	24857	2.28	0.61	6150	2.30	0.63	6726	2.25	0.59
Never married	36460	0.21	0.41	0	1	3718	0.20	0.40	31560	0.21	0.41	29204	0.20	0.40	7252	0.18	0.39	8115	0.20	0.40
Married	36301	0.66	0.47	0	1	3704	0.69	0.46	31422	0.66	0.47	29082	0.67	0.47	7222	0.68	0.47	8090	0.67	0.47
Married but separated	36301	0.01	0.10	0	1	3704	0.01	0.09	31422	0.01	0.10	29082	0.01	0.10	7222	0.01	0.10	8090	0.01	0.10
Widowed or divorced	36301	0.12	0.32	0	1	3704	0.11	0.31	31422	0.12	0.32	29082	0.12	0.32	7222	0.12	0.33	8090	0.13	0.33
Not employed	36173	0.03	0.17	0	1	3691	0.03	0.17	31318	0.03	0.17	28964	0.03	0.17	7200	0.03	0.17	8064	0.03	0.18
Pensioner	36173	0.19	0.40	0	1	3691	0.17	0.38	31318	0.20	0.40	28964	0.20	0.40	7200	0.21	0.41	8064	0.22	0.41
In education	36173	0.05	0.21	0	1	3691	0.05	0.21	31318	0.05	0.21	28964	0.04	0.20	7200	0.04	0.20	8064	0.04	0.20
Unemployed	36173	0.10	0.30	0	1	3691	0.09	0.29	31318	0.10	0.31	28964	0.11	0.31	7200	0.11	0.31	8064	0.12	0.32
Self-employed	36173	0.04	0.20	0	1	3691	0.05	0.22	31318	0.04	0.20	28964	0.04	0.19	7200	0.04	0.18	8064	0.04	0.20
Civil servant	36173	0.01	0.11	0	1	3691	0.007	0.08	31318	0.01	0.11	28964	0.01	0.10	7200	0.009	0.09	8064	0.01	0.11
White collar	36269	0.28	0.45	0	1	3697	0.29	0.45	31401	0.27	0.45	29041	0.27	0.44	7219	0.27	0.44	8083	0.25	0.43
Blue collar	36269	0.24	0.43	0	1	3697	0.24	0.43	31401	0.24	0.43	29041	.25	0.43	7219	0.26	0.44	8083	0.23	0.42
University degree	36290	0.23	0.42	0	1	3710	0.25	0.43	31402	0.23	0.42	29032	0.22	0.41	7196	0.21	0.41	8073	0.22	0.41
High education	35912	0.13	0.34	0	1	3674	0.15	0.35	31070	0.13	0.34	28759	0.12	0.32	7157	0.13	0.34	7981	0.12	0.33
Intermed. education	35597	0.79	0.41	0	1	3640	0 .78	0.42	30795	0.79	0.41	28498	0.80	0.40	7121	0.78	0.41	24836	0.80	0.40
Low education	35642	0.08	0.27	0	1	3644	0.08	0.27	30834	0.08	0.27	28535	0.08	0.27	7124	0.09	0.28	7938	0.10	0.31
No. persons in household	36715	3.01	1.19	1	8	3734	3.22	1.14	31786	2.99	1.20	29383	3.01	1.20	7284	2.80	1.06	8159	2.91	1.14
No. children in household	66357	0.83	0.99	0	6	6970	1.06	1.01	57477	0.82	0.99	52866	0.81	1.00	12898	0.69	0.92			
Available household income	28283	10.14	0.50	3.47	12.23	2859	10.19	0.49	24504	10.14	0.50	22638	10.13	0.50	5624	10.09	0.47	6248	10.07	0.47
West Germany	36715	0.03	0.17	0	1	3734	0.04	0.19	31786	0.03	0.16	29383	0.03	0.16	7284	0.04	0.20	8159	0.03	0.18
Unemployment experience	35404	0.36	0.93	0	19	3626	0.28	0.73	30665	0.36	0.95	28346	0.36	0.96	7049	0.36	0.92	7812	0.39	0.94
Unemployment rate (state)	32332	15.82	3.25	3.7	21.7	3286	14.91	3.21	28001	15.89	3.24	25885	16.02	3.25	6407	14.99	3.27	7169	15.32	3.10
Additional variables																				
Social security GDR	4335	0.43	0.50	0	1	446	0.42	0.49	3740	0.43	0.50	3457	0.44	0.50	862	0.43	0.50	978	0.45	0.50
Democracy GDR	4334	0.42	0.49	0	1	447	0.40	0.49	3738	0.43	0.50	3455	0.44	0.50	862	0.47	0.50	978	0.46	0.50
Life GDR	15028	0.23	0.42	0	1	1569	0.25	0.44	12984	0.23	0.42	12011	0.23	0.43	2934	0.21	0.41	3353	0.23	0.42
Happiness	36095	0.53	0.50	0	1	3690	0.53	0.50	31246	0.53	0.50	28894	0.53	0.50	7170	0.53	0.50	8031	0.51	0.50
Expected happiness in 5 yrs.	35945	0.61	0.49	0	1	3681	0.65	0.48	31123	0.61	0.49	28785	0.61	0.49	7132	0.63	0.48	7990	0.60	0.49
Population density	13467	405.37	895.88	52	3891	1341	229.95	86.66	11692	434.92	953.07									
Inhabitants older than 65	13467	15.74	1.59	12.4	19.1	1341	16.68	0.62	11692	15.69	1.63									
Unemployment rate (regional planning unit)	13467	18.05	2.88	6	23.4	1341	17.31	3.16	11692	18.08	2.83									
Average industrial wage	13467	2007.29	340.25	1035	3835	1341	17.31	3.16	11692	2016.23	348.74									
GDR per capita	13467	16.64	3.08	13.2	41.9	1341	16.59	3.62	11692	16.70	3.01									
Mother: Catholic	7067	0.07	0.25	0	1	719	0.10	0.30	6043	0.07	0.25									
Mother: Protestant	7067	0.32	0.47	0	1	719	0.32	0.47	6043	0.34	0.47									
Mother: Other	7067	0.04	0.19	0	1	719	0.04	0.18	6043	0.04	0.19									

Continued on next page

Table B.7 – continued from previous page

	All observations					Treatment group: Dresden			Control group: excl. Greifswald-Stralsund			Control group: excl. Berlin & Greifswald-Stralsund			Control group: Saxony			Control group: East		
Variable	Obs	Mean	Std.Dev.	Min	Max	Obs	Mean	Std.Dev.	Obs	Mean	Std.Dev.	Obs	Mean	Std.Dev.	Obs	Mean	Std.Dev.	Obs	Mean	Std.Dev.
Mother: Not religious	7067	0.57	0.50	0	1	719	0.55	0.50	6043	0.56	0.50									
Respondent(1990): Catholic	33534	0.06	0.23	0	1	3311	0.08	0.27	29117	0.05	0.23									
Respondent(1990): Protestant	33534	0.28	0.45	0	1	3311	0.26	0.44	29117	0.29	0.45									
Respondent(1990): Other	33534	.01	0.09	0	1	3311	0.01	0.12	29117	0.01	0.08									
Respondent(1990): Not religious	33534	0.66	0.48	0	1	3311	0.64	0.48	33534	0.66	0.48									
Low household income	1165	0.34	0.48	0	1	3652	0.26	0.44	28711	0.30	0.46									
Intermed. household income	1165	0.34	.48	0	1	3652	0.38	0.49	28711	0.38	0.49									
High household income	1165	0.31	0.46	0	1	3652	0.36	0.48	28711	0.32	0.47									

LEBENSLAUF

Tanja Hennighausen

03/2014	Promotion in Volkswirtschaftslehre an der Universität Mannheim
seit 06/2009	Wissenschaftliche Mitarbeiterin an der Universität Mannheim, Lehrstuhl für Volkswirtschaftslehre, Politische Ökonomie
05/2008 - 07/2012	Wissenschaftliche Mitarbeiterin am Zentrum für Europäische Wirtschaftsforschung (ZEW), Mannheim
12/2007	Abschluss als Diplom-Volkswirtin an der Universität Mannheim
10/2002 - 12/2007	Studium der Volkswirtschaftslehre an der Universität Mannheim
06/2002	Abitur an der Modellschule Obersberg in Bad Hersfeld

Eidesstattliche Erklärung

Hiermit erkläre ich, die vorliegende Dissertation selbständig angefertigt und mich keiner anderen als der in ihr angegebenen Hilfsmittel bedient zu haben. Insbesondere sind sämtliche Zitate aus anderen Quellen als solche gekennzeichnet und mit Quellenangaben versehen.

Mannheim, 11.12.2013

Tanja Hennighausen